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# USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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25 February 1985

# USSR REPORT

## LIFE SCIENCES

### BIOMEDICAL AND BEHAVIORAL SCIENCES

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TECHNOLOGY OF FODDER PRODUCTION AND PREPARATION

Moscow ZHIVOTNOVODSTVO in Russian No 9, Sep 84 pp 11-13

BOYARSKIY, L. G., professor, Chief, Department of Fodder Technology

[Abstract] Silage production and its preparation for consumption has benefitted from technological advances and resulted in products with superior nutritional value for domestic animals. A number of the factors involved in the production of high-quality silage from various type of fodder are discussed. Silage can be and is supplemented with various preparations, such as vitamins, enzymes, minerals, etc., to further improve its organoleptic and nutritive characteristics. More recently, a technique has been developed for the 'micronization' of grain for addition to silage products. This approach has been applied in the case of corn, sorghum, barley and other crops used as additives for silage.  
[1017-12172]

UDC 636.085.7

CHEMICAL FODDER PRESERVATION

Moscow ZHIVOTNOVODSTVO in Russian No 9, Sep 84 pp 13-14

VLADIMIROV, V.L., professor, and NAUMENKO, P.A., candidate of biological sciences

[Abstract] The importance of silage in the national economy of the USSR has led to the development of various means of fodder preservation with the retention of the nutritional value of the green biomass. Such practices are now widely used in Ukraine, Moldavia, Krasnodar Kray, the Baltic Republics, Siberia and the Northwestern Rayons of the RSFSR. The chemicals most often employed for such purposes are sodium pyrosulfate, propionic or benzoic acid, or other low MW acid concentrates. In addition, the use of chemical preservatives does not interfere with the subsequent addition of nitrogen, sulfur, phosphorus and other substances to the silage.

Physiological studies, conducted with animals fed silage prepared from preserved fodder, showed no adverse effects. It is important that personnel working with the application of the chemical preservatives be fully aware of the precautions that must be followed in working with volatile low MW acids.

[1017-12172]

UDC 636.082.23:576.3

#### CYTOGENETICS IN ANIMAL BREEDING

Moscow ZHIVOTNOVODSTVO in Russian No 9, Sep 84 pp 17-21

SMIRNOV, O.K., professor, GOL'DMAN, I.L., candidate of medical sciences, ZHIVALEV, I.K., candidate of biological sciences, KLENOVITSKIY, P. M., candidate of agricultural sciences, KONOVALOV, M.A., technologist, and ROZIKOVA, M.R. and CHEREKAYEVA, Ye.A., aspirants [graduate students]

[Abstract] A review is presented of various cytogenetic studies that have been shown useful in domestic animal breeding. In breeding-bulls, translocation 1/29 has been identified, indicating that such animals are carriers of constitutional chromosomal anomalies. In more recent studies, several cattle lines have been shown to exhibit chromosome Y polymorphism which has been found to be related to ejaculate volume and sperm motility. Studies on pigs have shown that aneuploidy tends to have a negative effect on the litter size, and similar findings have been found applicable to sheep. Cytogenetics has also been valuable in identifying cattle at risk of leukemia. In addition, such techniques also make it possible to assess the effectiveness of induced mutations in the creation of desirable domestic animal breeds. Figures 5.

[1017-12172]

UDC 636.22/.28.082.4

#### BIOTECHNOLOGY IN HERD PRODUCTION AT LARGE FARMS AND COMPLEXES

Moscow ZHIVOTNOVODSTVO in Russian No 9, Sep 84 pp 27-29

KLINSKIY, Yu.D., professor, SHEYKIN, V.N. and KUKSOVA, R.I., candidates of biological sciences, and BOYKO, N.A. and MADISON, V.V., veterinary physicians-technologists

[Abstract] The transformation of dairy herd production from a localized enterprise into an industrial complex has resulted in considerable savings in time and effort, as well as reduction in the cost of the final product. It is generally recognized that it is only within the framework of an industrial agrocomplex that advances of biotechnology can be fully utilized,



with biotechnology defined as using various means to control the physiological process of reproduction. Of particular usefulness have been the natural hormones and their synthetic congeners, the manipulative use of which can give full control over fertility and rate of maturation of the fetus. Obviously, used alone by themselves, such means would be relatively ineffective and too costly if not complemented by the most modern nutritive and physical management of the animals.

[1017-12172]

UDC 636.22/.28:612.64-02

#### CRYOPRESERVATION AND TRANSPLANTATION OF EMBRYOS

Moscow ZHIVOTNOVODSTVO in Russian No 9, Sep 84 pp 29-32

SERGEYEV, N.I., candidate of biological sciences, PLAKSEYEV, A.A., chief engineer, BUKAROVA, V.I., junior scientist, and SMYSLOVA, N.I., senior technologist

[Abstract] A survey is presented on the current practices of embryo cryopreservation and transplantation at the All-Union Institute of Animal Husbandry. Included are descriptions of some of the specially designed instruments and apparatus. Generally, cattle embryos are frozen when 7-8 days old. The conditions employed consist of initial freezing to  $-7^{\circ}\text{C}$  at a rate of  $1^{\circ}\text{C}/\text{min}$ , and subsequently at a rate of  $0.3^{\circ}\text{C}/\text{min}$  to  $-36^{\circ}\text{C}$ . The next stage consisted of freezing to  $-50^{\circ}\text{C}$  at a rate of  $0.1^{\circ}\text{C}/\text{min}$ , and transfer of the preparation into liquid nitrogen. Transplantation to recipients demonstrated that viability is retained by blastocysts with a zona pellucida to a greater degree than by those without the zona pellucida: the former showed an incidence of implantation of 42.8% on transplantation, while the latter presented with an incidence of 23.1%. Various other studies confirmed the effectiveness of dimethyl sulfoxide as a cryoprotective agent, and resulted in delineation of physiological and other criteria of embryo suitability for cryopreservation. With the current techniques and state of understanding, embryos can be stored at the temperature of liquid nitrogen ( $-195^{\circ}\text{C}$ ) for up to 12 months and still yield a 70% implantation rate on transplantation to recipients. Figures 3.

[1017-12172]

## SIGNIFICANCE OF BIOLOGICAL STATE OF SOIL FOR DEVELOPING ROOT ROT IN WHEAT

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKIKH NAUK in Russian vyp 2, No 13, Aug 84 (manuscript received 10 Jun 83) pp 59-63

KLEVENSKAYA, I. L. and KRIVOSHCHKOVA, T. G., Institute of Soil Science and Agrochemistry, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] Many problems must be resolved in order to intensify Soviet agriculture; of major importance are soil-borne plant diseases. The present article reports on study of dormant and infectious forms of *Bipolaris sorokiniana* in soil at the Novosibirsk agricultural institute in the southern chernozem of the Kuludin steppe region during 1978-1980. A flotation method was used to determine the conidium population of wheat root rot, while differentiation comparisons were used to assess the development and spread of the disease. Results indicated a correlation between the biological state of the soil and the development of common root rot in wheat. It was expressed either as a negative correlation of high significance between general biological activity of the soil determined by CO<sub>2</sub> emission and development of the disease, or (less dependably) in transformation of nitrogen-containing organic compounds (ammonification). Antagonistic microorganisms in the soil were also regarded to be of special importance. Numerous *Bacillus*, *Pseudomonas*, *Streptomyces*, and *Penicillium* subspecies were identified which had a negative effect on all levels of the epiphytotic processes studied. Increased rates of biological rotation related to carbon and nitrogen in the soil and increased amounts of microbes antagonistic to wheat root rot pathogens were regarded as the key methods for protecting spring wheat from this disease. References 17: 14 Russian, 3 Western. [082-12131]

UDC 531.19+522.4.056

## FUNCTIONAL ACTIVITY OF CHROMATIN AND POLYRIBISOME OF WHEATS ADAPTED TO FAR NORTH CONDITIONS

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR, SERIYA BIOLOGICHESKIKH NAUK, in Russian vyp. 2, No 13, Aug 84 (manuscript received 14 Jul 82) pp 42-47

SAPRYKIN, V. A., KILEV, S. N., ALEKSEYEV, V. G., SHCHERBAKOVA, T. M., YEGOROVA, M. S., CHEKUROV, V. M. and MERTVETSOV, N. P., Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk; Biology Institute, Yakutsk Branch, Siberian Department, USSR Academy of Sciences, Yakutsk

[Abstract] Previous studies have shown wheats acclimatized to the north to have high protein content related to transcription and translation processes

during hybridization. The present article reports on study of varieties of Saratovskaya 29 grown at Ust'-Kamenogorsk, with non-adapted seeds as the control. The variety "Yakutyanka" was also tested. Shoots 6-7 days old grown in various ways were pulverized and analyzed for chromatin and polyribisomes. Protein : DNA : RNA ratios were 10 : 6 : 1, as in previous tests. Further analysis of chromatin activity showed that that of Yakutyanka was twice that of Saratovskaya 29, whether grown in Yakutia or at Ust'-Kamenogorsk, while that in Saratovskaya 29 grown in the north had matrix activity 10-15% below that of Yakutyanka, thus indicating a 1.6 increase in transcription activity after long-term acclimatization. Translation activity of summary polyribosome was conducted with wheat germs, with determination of  $^3\text{H}$ -leucine by its fixation intensity in non-oxygen-soluble polypeptides. A linear dependency was noted for incubation time in a 5-10 minute period. These hormone-regulated changes bring more rapid germination and maturation under northern conditions. Figures 3; references 11: 6 Russian, 5 Western.  
[082-12131]

UDC 633.14:581.526.55

EFFECT OF AGROMETEOROLOGIC CONDITIONS OF VEGETATIVE SEASON ON DEVELOPMENT  
AND PRODUCTIVITY OF WINTER RYE

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA, SERIYA 16: BIOLOGIYA in Russian  
No 3, Jul-Sep 84 (manuscript received 3 Dec 82) pp 36-38

KUPERMAN, F. M. (deceased) and TORKOVA, Ye. V.

[Abstract] Development of a popular brand of winter rye -- Voskhod I -- was studied during 1977-1980 years when the agrometeorologic conditions deviated considerably from the average annual readings. It was noted that early appearance and duration of various organogenetic stages had no effect on vernalized flowers and matured grains in each spike. This could be effectively monitored by the number of flowers formed during the V stage of organogenesis and the number of grains during the XII stage. In 1978, when the V stage occurred at the earliest time and the III-V stages lasted a long time, the formation of flowers during the V stage and the grains in the XII stage was the greatest. Thus it appeared to be possible to prognosticate the yield of winter rye as early as in the spring months. Reference 1 (Russian).  
[087-7813]

## EFFECTS OF SH-REAGENTS ON RAT HEPATIC ALDEHYDE DEHYDROGENASE ACTIVITY

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 6, Nov-Dec 84  
(manuscript received 19 Dec 83) pp 628-633

KONOPLITSKAYA, K.L., KUZ'MINA, G.I., GRIGOR'YEVA, M.V. and POZNYAKOVA, T.N.,  
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[Abstract] Liver serves as the primary organ for the oxidation of ingested ethanol via a pathway involving alcohol- and aldehyde dehydrogenase. In view of the problem of alcoholism, three enzymes are of particular interest in understanding the biochemical mechanism that may be involved in alcohol addiction and in the formulation of therapeutic approaches. While alcohol dehydrogenase has been studied in considerable detail, current attention is centered on aldehyde dehydrogenase. A comparative analysis of the effects of a series of SH-active reagents -- tetraethylthiuram disulfide (TETD), 5,5-dithiobisnitrobenzoic acid (DTNB), p-chloromercuribenzoate (PCMB), and N-ethylmaleimide (NEM) -- were tested for their effects on the activity of aldehyde dehydrogenase of the hepatic mitochondrial (isozymes I and II) and microsomal (isozyme II) fractions of outbred albino rats. DTNB was found to inhibit by 100 and 50% mitochondrial isozymes I and II, respectively, and by 20% the microsomal enzyme under the conditions employed. DTNB and NEM inhibited by 30 and 50% isozymes I and II of the mitochondria, but had no effect on the microsomal isozyme. In addition, PCMB inhibited completely all of the isozymes. Studies with DTNB showed that  $\text{NAD}^+$  and acetaldehyde prevented enzyme inactivation, although the mechanism of the protective effects remains unclear. These studies demonstrated the importance of functional SH-groups to the activity of aldehyde dehydrogenase; differences in the susceptibility of the mitochondrial and microsomal isozymes indicate profound conformational and structural differences among the different isozymes. Figures 3; references 24: 1 Polish, 4 Russian, 19 Western. [1650-12172]

## EFFECT OF SYNTHETIC WATER SOLUBLE POLYELECTROLYTES ON STRUCTURE, CATALYTIC ACTIVITY AND STABILITY OF FORMATEDEHYDROGENASE AND ALCOHOLDEHYDROGENASE

Moscow BIOKHIMIYA in Russian Vol 49, No 9, Sep 84 (manuscript received 31 Oct 83) pp 1431-1440

DIKOV, M. M., KARULIN, A. Yu., ISIPOV, A. P., YEGOROV, A. M., BEREZIN, I. V., MUSTAFAYEV, M. I. and KABANOV, V. A., Faculty of Chemistry, Moscow State University imeni M. V. Lomonosov

[Abstract] Stability, physical-chemical and catalytic properties of formate-dehydrogenase (FDH) of methylotrophic bacteria, *Achromobacter parvulus* I, was studied along with alcoholdehydrogenase (ADH) of horse liver complexed with water-soluble polyelectrolytes. It was established that formation of a complex between FDH and hydrophobic polycations led to structural alterations of protein globules resulting in decreased activity and thermal stability of the enzyme. Depending on the temperature, either chemical inactivation of the enzyme took place (oxidation of its sulfhydryl groups) or thermal deactivation. Complex formation between FDH and copolymers of 2-methyl-5-vinylpyridine and acrylic or methacrylic acid led to an increase in the catalytic activity; the thermal stability was barely affected. When the protein was reacted with sodium polystyrosulphonates, the enzyme was deactivated. A conclusion was reached that a positively-charged bubble was formed around the protein globule and it protected the SH-groups of the proteins from oxidation. Figures 8; references 27: 18 Russian, 9 Western (3 by Russian authors).  
[1597-7813]

UDC 577.127

## EFFECT OF ETHANOL ON ENKEPHALINERGIC OPIOID SYSTEM OF RAT BRAIN

Moscow BIOKHIMIYA in Russian Vol 49, No 9, Sep 84 (manuscript received 13 Oct 83) pp 1425-1430

BELYAYEV, N. A., BALAKIREVA, N. N., BRUSOV, O. S. and PANCHENKO, L. F., All-Union Scientific Research Institute of General and Forensic Psychiatry imeni V. P. Serbskiy, USSR Ministry of Health, Moscow

[Abstract] Specific binding of  $^3\text{H}$ -morphine and  $^3\text{H}$ -(D-Ala<sup>2</sup>, D-Leu<sup>5</sup>)-enkephalin (H-EN) with opiate receptors was studied on white rats along with the content of Met- and Leu-enkephalin and the activity of enkephalinase in various brain segments after single dose (20% solution in 0.9% NaCl, IP; 1.5-4.5 g/kg body weight) and chronic injection (20% EtOH substituted for drinking water) of ethanol. The single injection of EtOH (1.5-4.5 g/kg) resulted in a depression of the specific binding of H-EN with opiate receptors. Doses of 1.5 and 2.5 g/kg led to a lower content of Leu-enkephalin in mid-brain

but to an increase of Met-enkephalin; the 4.5 g/kg dose had no effect on the striatum. With chronic administration of EtOH, most of the values obtained on the experimental animals were similar to the control data. It was concluded that ethanol shows an activation effect on the systems responsible for liberation and utilization of enkephalins. The adaptation process of enkephalinergic neurotransmission to chronic exposure of EtOH is related to a lowering of functional activity of these systems. References 23: 5 Russian, 18 Western.

[1597-7813]

UDC 577.125

IN VITRO INCLUSION OF 1-O-ALKYL-2-ACETYL-sn-GLYCERO-3-PHOSPHOCHOLINE INTO LIPOPROTEINS OF HUMAN PLASMA. EFFECT ON LECITHIN:CHOLESTEROL PLASMA ACYLTRANSFERASE ACTIVITY

Moscow BIOKHIMIYA in Russian Vol 49, No 9, Sep 84 (manuscript received 9 Nov 83) pp 1449-1455

KULIKOV, V. I., MUZYA, G. I. and BERGEL'SON, L. D., Institute of Bioorganic Chemistry imeni M. M. Shemyakin, USSR Academy of Sciences, Moscow; All-Union Scientific Cardiological Center, USSR Academy of Medical Sciences, Moscow

[Abstract] The interaction of platelet activation factor (PAF) with individual lipoproteins of human plasma was studied. It was shown that low-density lipoprotein (LDL) and high-density lipoprotein (HDL) differ in their interaction with PAF: LDL binds nonspecifically to PAF while HDL exhibits high affinity binding sites for PAF. Due to the fact that HDL is both a substrate and an activator of lecithine-cholesterol acyltransferase (LCAT), the principal enzyme regulating plasma levels of cholesterol, the effect of PAF on the activity of transferase was studied showing that incubation of PAF with plasma inhibits the enzyme substantially. In contrast, prostaglandin E<sub>1</sub> stimulated the activity of LCAT. It was concluded that PAF may play an important role in regulating cholesterol metabolism in plasma. Figures 4; references 20: 1 Russian, 19 Western.

[1597-7813]

PROPERTIES OF PHOSPHOLIPASE A<sub>2</sub> FROM VENOM OF VESPA ORIENTALIS HORNET

Moscow BIOKHIMIYA in Russian Vol 49, No 9, Sep 84 (manuscript received 30 Jun 84) pp 1546-1555

TUYCHIBAYEV, M. U., YAKUBOV, I. T., RAKHIMOV, M. M. and TASHMUKHAMEDOV, B. A.,  
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State University imeni V. I. Lenin

[Abstract] The method for obtaining phospholipase A<sub>2</sub> from venom of hornets, and its principal physical-chemical properties, were described in a previous paper. In this paper the following properties were described: optimal pH (8-9), optimal temperature and stability of the enzyme (50°, retaining its activity for 6-8 hrs), effect of metal ions (the following series of activating ability was established:  $\text{La}^{3+} > \text{Mn}^{2+} > \text{Ca}^{2+} > \text{Al}^{3+} > \text{Ba}^{2+} > \text{Co}^{2+} > \text{Mg}^{2+} > \text{Sr}^{2+}$ , while the inhibiting effect was as follows  $\text{Cu}^{2+} > \text{Zn}^{2+} > \text{Fe}^{3+}$ ), reaction rates, substrate specificity, N-terminal amino-acid sequence, hemolytic activity and toxicity. Overall, the phospholipase A<sub>2</sub> from the hornet venom represents a special type of an enzyme: on the one hand, it is similar to the other known phospholipases A<sub>2</sub>, and on the other -- it differs (as compared to the lipases from mammalian pancreatic gland or from the venom of various animals). Figures 7; references 38: 15 Russian (2 by Western authors) 23 Western.  
[1597-7813]

## PURIFICATION OF NEURAMINIDASE FROM INFLUENZA VIRUS ON IMMUNOSORBENT

Moscow BIOKHIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received 17 Oct 83) pp 1588-1593

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[Abstract] A method was described for isolation of protein from influenza virus membrane followed by enrichment and isolation of the neuraminidase preparation; the latter presents an important step in the study of antigenic structure of influenza virus and in production of vaccines. After an unsuccessful solubilization of neuraminidase with proteases, the nonionic detergent Triton X-100 was used (0.3% concentration). The preparation obtained was passed through a column with antibodies towards hemagglutinin immobilized on BrCN-sepharose 4B. To concentrate this preparation, a triple precipitation with acetone was used. Thus-prepared neuraminidase retained its enzymatic and antigenic properties and exhibited one protein band on electrophoretic separation under denaturing conditions. Figures 4; references 8: 1 Russian, 7 Western.  
[1598-7813]

COMPARISON OF RECOGNITION SITE SPECIFICITY OF ADENYL AND CYTOSYL DNA  
METHYLASES OF YERSINIA PESTIS EV 76 dam AND dcm BY E. COLI METHYLASES

Moscow BIOKHIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received  
27 Oct 83) pp 1594-1597

DEMIDOVA, G. V., GONCHAROV, Ye. K. and TYTYANOVA, V. I., Rostov-on-Don  
State Scientific Research Antiplague Institute

[Abstract] Two methods were used for comparison of site specificity of adenyl and cytosyl DNA methylases of plague microbe with dam and dcm methylases of E. coli: in vitro heterologic methylation of chromosomal DNA and restriction analysis of pBR 322 plasmid. The data showed that the methylase EcoRII actively methylated DNA of plague microbe while M-Eco dam had practically no effect. Evidently, adenyl methylase Y. pestis EV 76 belongs to the dam type E. coli methylases, while the cytosyl DNA methylase of plague bacteria is not identical with the methylase of intestinal bacillus. In summary, experimental data supported the presence of adenyl DNA-methylase in Y. pestis EV 76 cells with specificity Eco dam and the absence of cytosyl DNA-methylase with the Eco RII specificity in these cells. Figures 2; references 15: 6 Russian, 9 Western.  
[1598-7813]

USE OF IMMOBILIZED ETHIDIUM BROMIDE FOR ISOLATION AND FRACTIONATION OF DNA  
FROM SOLUTIONS, BIOLOGICAL FLUIDS AND CELL LYSATES

Moscow BIOKHIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received  
13 Feb 84) pp 1708-1711

FEDOROV, N. A., KLEMYASHOV, G. P., TIMOFEYEV, A. M., KORESHKOVA, N. A. and  
BOROVKOVA, T. V., Central Scientific Research Institute of Hematology and  
Blood Transfusion, Moscow

[Abstract] An attempt was made to separate denatured and native DNA and to isolate high molecular weight DNA from cell lysates and biological fluids using ethidium bromide (EB) immobilized on polyacrylamide gel, Bio-Gel R-4. The experimental data obtained showed that this method can indeed be used for fractionation of DNA and for its isolation from complex biological materials. The advantage of this method over the widely-used chromatography on hydroxyapatite is much higher loading capacity of DNA (1 g of DNA per gram of dry material) and the ability to use high molecular weight DNA without prior fermentation. Figures 2; references 7 (Western).  
[1598-7813]



## SUPEROXIDE GENERATION DURING REACTION OF MELANINES WITH OXYGEN

Moscow BIOKIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received 16 Feb 84) pp 1712-1718

LAPINA, V. A., DONTSOV, A. Ye. and OSTROVSKIY, M. A., Institute of Chemical Physics, Moscow

[Abstract] In an attempt to evaluate the role of melanosomes as intracellular organelles with photoprotective effect in vivo, reaction of synthetic DOPA-melanine, pheomelanine and melanosomes with oxygen was studied evaluating the ability of forming the superoxide anions ( $O_2^-$ ) as intermediate products, and the dependence of this process on lighting conditions. Under conditions of 0.1 M K-phosphate buffer and pH 7.4, under lighting or in darkness, photo-induced oxidation of melanine was not observed. In presence of detergent (cetyltrimethyl-ammonium bromide -- CTAB) nitroblue tetrazolium (NTB) was reduced to formazan; light had an insignificant stimulating effect on this process. Superoxide dismutase was an effective inhibitor of this reaction. Mechanism of CTAB action was not quite clear; it could act as a stabilizer, it could be responsible for the increasing contact surface or it could prolong the viability of superoxide radicals. Although theoretically  $O_2^-$  could be generated during melanin oxidation of melanosomes, under in vivo conditions this would be highly doubtful. Figures 5; references 20: 6 Russian, 14 Western.

[1598-7813]

UDC 547.963+32.854

## ADENOSINE-5'-TRIPHOSPHATE GAMMA-AMIDES--DERIVATIVES OF NITROGEN YPERITES

Moscow BIOORGANICHESKAYA KHIMIYA in Russian Vol 10, No 11, Nov 84 (manuscript received 22 Mar 84) pp 1525-1534

GRACHEV, M.A., MUSTAYEV, A.A., KURBATOV, V.A., SAZONOV, I.T. and SAFRONOV, I.V., Novosibirsk Institute of Organic Chemistry, Siberian Department, USSR Academy of Sciences

[Abstract] Synthesis and properties of 3 derivatives of adenosine-5'-triphosphate and nitrogen yperite (I- 2-chloroethylamine, II-N-methyl-2-chloroethylamine, III-bis(2-chloroethyl)amine) are described and discussed. Compounds II and III possessed both alkylating and phosphorylating activity. Compound I was transformed in a water medium into slightly reactive gamma-ethylene amide of ATP. Compound II was found to be an affine reagent for RNA-polymerase from E. coli and for rabbit muscle creatinase. Figures 7; references 10: 4 Russian, 6 Western.

[1642-2791]

UDC 617.741-004.1-07:617.741-008.939.6-02:612.014.44

WATER SOLUBLE PROTEINS OF CRYSTALLINE LENS OF NORMAL PERSONS AND THOSE WITH CATARACTS AND THEIR RESISTANCE TO EFFECT OF ULTRAVIOLET AND VISIBLE LIGHT

Moscow VESTNIK OPTAL'MOLOGII in Russian No 4, Jul-Aug 84 (manuscript received 20 Dec 83) pp 64-66

BIRICH, T.V., Professor, corresponding member BeSSR Academy of Sciences, POZNYAK, N.I., candidate of medical sciences, PROKOSHINA, N.A. and CHERENKEVICH, S.N., Department of Eye Diseases (Head of Department, Professor T.V. Birich), Minsk Medical Institute, Department of Biophysics (Head of Department Candidate of Mathematical Sciences S.N. Cherenkevich), Belorussian University imeni V.I. Lenin, Minsk

[Abstract] Study of the effect of ultraviolet light and visible light on water-soluble proteins of the cortex and nucleus of normal and cataractal human crystalline lenses and their resistance to such action are described and discussed and some features of some physico-chemical properties of proteins of normal and pathologically-modified crystalline lenses are explained. Normal crystalline lenses were taken from enucleated eyes of persons who had died no more than 5-7 hours after enucleation of the eyes. The studies showed differences in the fluorescence spectra of proteins of healthy and cataractal crystalline lenses both in the position of peaks of fluorescence spectra and in fluorescence intensity in the ultraviolet and visible regions of the spectrum. Water-soluble proteins of the lens cortex were more stable in visible light than nuclear proteins were. The experiment showed the essential role of photochemical accumulation of products of photolysis of proteins of a cumulative nature in development of a mature cataract. Figures 3; references 5: 2 Russian, 3 Western.  
[1645-2971]

## TETRACYCLINE RESISTANCE IN E. COLI B IN RELATION TO MEMBRANE PROTEINS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 10, Oct 84  
(manuscript received 29 Apr 84) pp 1045-1050

VIRINA, A.M., BELOUSOVA, I.I. and BEZRUKOV,\* S.M., All-Union Scientific Research Technologic Institute of Antibiotics and Medically Useful Enzymes, Leningrad; \*Leningrad Institute of Nuclear Physics imeni B.P. Konstantinov, USSR Academy of Sciences

[Abstract] Membrane proteins of tetracycline-resistant (120 or 200 mcg/ml minimum inhibitory concentration) E. coli B and the original susceptible strain (2.5 mcg/ml) were compared, as an approach to the assessment of mechanisms responsible for tetracycline resistance in E. coli. The resistant strains showed a marked decrease in the concentration of the protein porin Omp F, and an increase in the concentration of Omp A, in comparison with the parental susceptible strain. In addition, acquisition of resistance was accompanied by a decrease in the level of accumulation of tetracycline by both intact cells and the isolated membrane preparations. These observations indicate that the loss of porin Omp F from the cell outer membrane may decrease and/or modify the channels through which tetracycline enters E. coli cells. Studies with monolein bilayer lipid membranes demonstrated that incorporation of porin Omp F (as a purified preparation or as constituent of cell membrane fragments) led to discrete step-wise increases in electroconductivity, consonant with channel formation. Presumably, in the intact susceptible cells, porin Omp F has a similar channel-forming function through which tetracycline enters the cell. Figures 3; references 23: 5 Russian, 18 Western.  
[1589-12172]

UDC 577.354.2

## EFFECTS OF PHOSPHORYLATED RHODOPSIN ON LIGHT-DEPENDENT ACTIVATION OF CYCLIC-NUCLEOTIDE PHOSPHODIESTERASE IN BOVINE RETINAL OUTER SEGMENT RODS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 10, Oct 84 (manuscript received 15 May 84) pp 1051-1056

DIZHUR, A.M., ARSHAVSKIY, V.Yu., SHESTAKOVA, I.K. and FILIPPOV, P.P., Moscow State University imeni M. V. Lomonosov; Interfaculty Scientific Research Problems Laboratory of Molecular Biology and Bioorganic Chemistry imeni A.N. Belozerskiy

[Abstract] In order to delineate the role of phosphorylated rhodopsin in ATP-dependent inhibition of cyclic-nucleotide phosphodiesterase (PDE), a cell-free system of bovine retinal outer rods was used to test the effectiveness of phosphorylated and unphosphorylated rhodopsin in activating

PDE. The photoreceptor membranes were much less efficient in stimulating light-dependent activation of PDE after phosphorylation of rhodopsin, with the actual degree of activation corresponding linearly to the proportion of unphosphorylated rhodopsin. Phosphorylation, therefore, appears to be the mechanism responsible for inactivation of rhodopsin (i.e., metarhodopsin II) vis-a-vis PDE prior to its conversion to inactive opsin. Figures 3; references 16 (Western).  
[1589-12172]

UDC 577.352.26

#### REGULATION OF INTERLAMELLAR SPACE BETWEEN TWO BILAYER LIPID MEMBRANES BY EXTERNAL VOLTAGE

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 10, Oct 84 (manuscript received 25 May 84) pp 1064-1070

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[Abstract] Electrophysiological studies were conducted on bilayer lipid membranes (BLM), prepared from total lipid fraction of bovine brain in n-heptane (with or without valinomycin), to delineate factors that may function in the regulation of interlamellar distance between adjacent BLMs. Application of an external voltage made it possible to regulate the distance between the membranes within the range of 20 to 150 nm in the electrolyte system employed, due to changes in the electroosmotic inflow and outflow of water from the space. At a distance of ca. 20 nm, the electroosmotic pressure may attain values of  $10^4$  N/m<sup>2</sup> in 0.25 nM KCl, and an external potential of -100 mV. The external potential can be used to induce auto-oscillations in the adjacent BLMs, which are reminiscent of fluctuations in cell membranes. Consequently, this model system may approach actual involvement of ion transport systems in regulating intermembranous space. Figures 4; references 9: 7 Russian, 2 Western.  
[1589-12172]

NIGERICIN AND GRISORIXIN ANTIBIOTICS IN ELECTROGENIC TRANSMEMBRANOUS  
TRANSPORT OF POTASSIUM AND HYDROGEN IONS

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 10, Oct 84 (manuscript  
received 29 May 84) pp 1071-1086

SOKOLOV, V.S. and MARKIN, V.S., Institute of Electrochemistry imeni  
A.N. Frumkin, USSR Academy of Sciences, Moscow

[Abstract] A previously-described experimental approach [Sokolov, VS,  
and Kuz'min, VG, Biofizika, 25:170-172, 1980] was used to study the effects  
of the antibiotics nigericin and grisorixin on electrogenic transport of  $K^+$   
and hydrogen across bilayer lipid membranes (BLM). The degree of conductivity  
induced by the antibiotics was dependent on the surface charge of the BLM,  
and showed a decrease on adsorption of the positively charged  
cetylpyridinium bromide and an increase on adsorption of floretin [sic].  
The kinetic data were interpreted to indicate that current transport across  
the BLM was due to the positively charged antibiotic complexes, with the  
actual conductivity being proportional to the square of the antibiotic  
concentration. Conductivity was enhanced by elevations in potassium concen-  
tration and showed a complicated pH-dependence. At some pH values, the mem-  
brane potential induced by potassium gradient coincided with the equilibrium  
membrane potential, and at other values exceeded it. Under certain condi-  
tions the membrane potential in the face of a pH gradient had an inverse  
sign to that of the proton-selective equilibrium potential. The data were  
used to construct a theoretical model of ionic transport in which positively  
charged antibiotic dimers are involved in the transfer of electric current  
across the BLM. Figures 10; references 24: 6 Russian, 18 Western.  
[1589-12172]

## BIOTECHNOLOGY

### ANTIBIOTICS ON STREAM. COMPETITION FOR USSR STATE PRIZE

Tallinn SOVETSKAYA ESTONIYA in Russian 2 Oct 84 p 2

FAVORSKAYA, A.

[Abstract] The Ministry of the Medical Industry has submitted a research project for the USSR State Prize; this project bears the title: "Creation of a scientific basis and development of technology for and industrial introduction of biocatalytic processes to prepare key compounds in the production of betalactam antibiotics." The work was begun in the early 1970s by Professor Ado Kestner, now the head of the Department of Organic and Biological Chemistry at the Tallinn Polytechnic Institute (TPI), and continued with the collaboration of the All-Union Scientific Research Institute of Antibiotics, the Moscow State University, the Riga and Saransk plants for producing medical preparations and TPI. The preparation of enzymes used in biocatalysis by biological rather than chemical synthesis has several advantages: products of biological synthesis are more organic and therefore more suitable for humans, and the synthesis itself causes little air, water or soil pollution. Kestner's work began with the search for natural catalytic enzymes that would be reliable and remain active for a long time; the object of the research was the main ring of penicillin which could be used as the basis for new antibiotics. By 1975, the new technology had been developed and adopted first by the Riga plant and later by the Saransk plant. The key compounds for antibiotic production were produced by biocatalysis for the first time on a large scale with a saving of more than 40 million rubles. All this was achieved within a single Five-Year Plan. Kestner attributes the rapid results to strict adherence to a schedule. The All-Union Scientific Research Institute of Antibiotics first found a suitable microorganism and enzymes and determined the cultivation conditions and technology for obtaining the enzymes. The Riga and Saransk plants produced the enzyme, which was sent to TPI where the enzyme was immobilized. The success of the new procedures can also be traced to the fact that all possibilities were taken into account; the biocatalytic processes were described by kinetic equations and analyzed by computer, and optimal parameters were selected. Not to be ignored are also the talented people working on the project, who include, in addition to Kestner, docents Mikhhel Mandel and Enn Siymer. The original research has also received many certificates of authorship. Figures 2 (photos of Siymer, Mandel and Kestner)

[048-9307]

# INVESTIGATION OF pH-DEPENDENCE OF KINETIC PARAMETERS AND INHIBITION WITH SUBSTRATE OF L- $\alpha$ -AMINOCAPROLACTAM HYDROLASE FROM CRYPTOCOCCUS LAURENTII CELLS

Moscow BIOKHIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received 5 Jan 84) pp 1650-1655

SHVYADAS, V. K., GALAYEV, I. Yu., KOZLOVA, Ye. V. and KORMER, S. S.,  
Laboratory of Molecular Biology and Bioorganic Chemistry imeni M. V.  
Lomonosov, Moscow

[Abstract] The goal of this work was to quantitate the kinetic regularities of the reaction of highly purified L- $\alpha$ -aminocaprolactamhydrolase (I) obtained from *Cryptococcus laurentii* cells. The experimental data could be described by a kinetic system of two substrate forms: a protonated and a non-protonated one. It was shown that  $\epsilon$ -caprolactam was an effective inhibitor of I. The competitive inhibition constant was shown to be independent of pH. Overall it appeared that I is an enzyme sensitive to pH of the reaction medium and to the concentration of the hydrolyzed substrate. It exhibited maximum catalytic activity at pH 8.5-9.0 with L- $\alpha$ -aminocaprolactam concentration of about 30 mM. Figures 5; references 8: 4 Russian (1 by Western author), 4 Western.

[1598-7813]

# STUDY OF CATALYTIC PROPERTIES OF GLUCOSE OXIDASE IMMOBILIZED ON POLYMERIC SEMICONDUCTOR CARRIERS

Moscow BIOKHIMIYA in Russian Vol 49, No 10, Oct 84 (manuscript received 15 Feb 84) pp 1703-1707

YAROLOV, A. I., MALOVIK, V. and IZUMRUDOV, V. A., Institute of Biochemistry imeni A. N. Bakh, USSR Academy of Sciences, Moscow; Chemistry Faculty of Moscow State University imeni M. V. Lomonosov

[Abstract] Investigations of electrochemical oxidation of glucose may lead to development of analytical methods for glucose determination or to new electrodes for electrochemical energy transformation. One of the important problems in this area is the coupling of enzymatic and electrochemical reactions. Most of the bioelectrocatalytic systems perform on the basis of mediator electron transport in which the transfer agent is immobilized on the surface of an electrode. In this work, polyxylenedipyridyl was used as the polycation; it happens to be the substrate for the glucose oxidase. The experimental results showed that immobilization of glucose oxidase on the ion-radical salt polyxylylene dipyridyltetracyan-p-quinodimethane (PXDP-TCQD)

is accompanied by an increase of specific activity and stability of the enzyme. The system described is characterized by high catalytic activity in electrochemical oxidation of glucose. This system of enzyme immobilization could be used for production of enzyme electrodes of bioenergetic elements or analytical sensors. Figures 4; references 9: 5 Russian, 4 Western. [1598-7813]

UDC 577.152

#### ISOLATION OF $\text{Co}^{2+}$ -BINDING PROTEIN FROM YEASTS AND ITS PROPERTIES

Moscow BIOKHIMIYA in Russian Vol 49, No 9, Sep 84 (manuscript received 11 Mar 84) pp 1492-1495

BELOV, A. O. and DAVIDOVA, Ye. G., Moscow Agricultural Academy imeni K. A. Timiryayev

[Abstract] The goal of this work was to study the chemical state of  $\text{Co}^{2+}$  ions accumulated in yeast cells and to isolate proteins binding specifically the intracellular  $\text{Co}^{2+}$ . Preliminary separation of soluble proteins on a sephacryl column S-300 yielded a fraction with high content of  $\text{Co}^{2+}$ . Next, the soluble fraction was reprecipitated with 80% acetone, increasing 5-fold the specific content of  $\text{Co}^{2+}$ , followed by fractionation on DEAE sephadex and again on sephadex G-50. The fraction with the highest specific content of  $\text{Co}^{2+}$  was lyophilized and its purity checked by electrophoresis in a gradient of polyacrylamide gel. The protein showed a single band. By means of this layer gel chromatography, its molecular weight was determined to be  $5000 \pm 500$  D. The biological role of  $\text{Co}^{2+}$ -binding protein is still unclear. Figures 2; references 14: 7 Russian (2 by Western authors), 7 Western. [1597-7813]

UDC 541.64:542.954

#### SYNTHESIS OF POLYAMIDES WITH PEPTIDE BONDS SUSCEPTIBLE TO ENZYMATIC CLEAVAGE

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 114, No 2, May 84 (manuscript received 24 Mar 83) pp 321-324

KATSARAVA, R.D., KHARADZE, D.P., KIRMELASHVILI, L. I., BENDIASHVILI, T.M. and ZAALISHVILI, M.M., corresponding member, Georgian SSR Academy of Sciences, Institute of Physiology imeni I.S. Beritashvili, Georgian SSR Academy of Sciences

[Abstract] The oxazolinone approach was used to synthesize biodegradable macromolecules that may have potential usefulness in medicine, agriculture and pharmaceutical sciences. Essentially, the Schotten-Baumann reaction was employed in the synthesis of 2,2'-p-phenylene-bis-oxazolinone monomers in



50-80% yield, followed by polycondensation with hexamethylenediamine in dimethylacetamide to produce a copolymer containing various essential hydrophobic amino acids, including phenylalanine and methionine. By varying the number and ratio of bis-oxazolinones, the composition of the final product can be regulated and made to approximate protein amino acid patterns. The reaction of the bis-oxazolinones with hexamethylenediamine is an additive process and, thus, uncomplicated by the production of low MW side products. Both the liquid and solid forms of the polyamides were completely resorbed within 4-5 months on implantation into animals. References 9: 5 Russian, 4 Western.  
[1585-12172]

SOME FEATURES OF DIGESTION IN BATS

Moscow ZOOLOGICHESKIY ZHURNAL in Russian Vol. 63, No 10 Oct 84 (manuscript received 17 May 83) pp 1594-1596

ZHAROVA, G.K., Institute of Animal Evolutionary Morphology and Ecology, USSR Academy of Sciences (Moscow)

[Abstract] Sequential autopsy of groups of bats captured at the same time was used to determine features and rate of gastric digestion in bats (Eastern bat *Vespertilio superans* and the bearded little brown bat *Myotis mystacinus*). Parallel measurement of the pH of stomachal content was used to determine the period of intense gastric digestion as indicated by increase of gastric acidity in a study performed in Eastern Mongolia in 1982. Animals of both species, captured in the state of rest, between 0500 and 0600, were studied. Several animals were sacrificed each hour from 0700 until complete emptying of the stomach. *Myotis mystacinus* had lower maximum acidity of stomachal content than *Vespertilio superans* and the process of gastric digestion from the onset of increase of H-ion concentrations was more prolonged in *Myotis mystacinus*. Complete emptying of stomachal content required 13 hours for *Vespertilio superans* and 14-15 hours for *Myotis mystacinus*. Bats captured in the morning had a full stomach but the pH of this content was, up until 0010, in a range in which hydrolysis of protein does not occur or is insignificant. Gastric digestion, indicated by an increase of acidity, was noted only after 1000 and was accompanied by evacuation of stomachal content which continued 3-4 hours. Complete emptying was at least 8-9 hours after onset of day sleep. The bats studied differed from other mammals in that there is about a 5-hour delay of the digestion process in the state of deep day sleep under natural conditions. References 6: 5 Russian, 1 Western.  
[077-2791]

## CHANGES OF STRUCTURAL ELEMENTS OF BAT ORGANS IN PERIODS OF ACTIVITY AND HIBERNATION

Leningrad ARKHIV ANATOMII GISTOLOGII I EMBRIOLOGII in Russian No 9, Sep 84, pp 47-52

KLIKA, E. and ZAITSOVA, A., Department of Histology of Charles University, Faculty of Medicine, Prague, Czechoslovakia

[Abstract] Structure of the myocardial coat of the pulmonary veins and of the lungs themselves was studied and a comparison of the myocardium, the skeletal musculature and the liver in the hibernation period with analogous structures in the active phase of life of bats were presented and discussed. Myotis bats were studied; 4 were captured in January and 1 was captured in July. Animals captured in winter were kept at 4 C for 16 hours and, if they did not become active, the organs and materials were studied by light microscopy and electron microscopy. Material from the bat caught in July was fixed immediately and studied in the laboratory. Significant reduction of function of the cardio-vascular system (especially the heart) and also of the motor apparatus, the lungs and liver in hibernating bats was accompanied by morphological changes but did not involve fundamental ultrastructural changes. The ultrastructure of the skeletal musculature fiber did not change significantly. There was obvious narrowing of the capillary bed of the pulmonary alveoli with substitution, in nuclei of their granular cells, of chromatin by lamellar myelin-like corpuscles while the cytoplasm contained inclusions containing electron-opaque material with a plastic structure. These inclusions have electron-transparent content in active bats and are surrounded by a wide osmiophylic rim. Hepatocytes in liver of hibernating bats lost glycogen, the number of lipid vacuoles and the number of electron-opaque multivesicular corpuscles increased. It was surmised that the structural base of organs of hibernating bats is prepared and adapted for rapid transition to full activity. Figures 6; references 9 Western.  
[072-2791]

UDC (577.34+547.64) (28)

## ECOLOGIC FEATURES OF BODIES OF WATER IN MID URALS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 30 Mar 81) pp 54-61

PISKUNOV, L.I., OSHCHEPKOVA, A.N., TREYGER, S.I., LYUBIMOVA, S.A. and KARAGODINA, I.V., Sverdlovsk Oblast Sanitary Epidemiologic Station

[Abstract] An ecologic study was conducted on the status of the Beloyarsk Reservoir and Shartash and Isetskoye lakes in the Sverdlovsk Oblast, all of which are used extensively for recreational purposes by the populace, and also

as sources of cooling waters for the local nuclear power plants. Data on the hydrochemical, physicochemical and radiochemical characteristics of the waters in each reservoir or lake are provided in tabular form, and indicate that, in general, they differ little. The radionuclide concentration in Lake Shartash is somewhat higher than in the other two water bodies, but this merely reflects the fact that Lake Shartash lacks an outflow. In addition, there were no significant differences in the Sr-90 levels in the aqueous plants or bottom deposits among the three water bodies. However, Cs-137 accumulations in the plants and bottom deposits did differ, presumably due to ecologic peculiarities of each aqueous environment and possible lack of an equilibrium state among the various components. In view of the increasing recreational use to which these water bodies are being put, it seems that close monitoring of their ecologic state is called for. References 12 (Russian).

[1593-12172]

UDC 576.8+574.632

#### DEGRADABLE ORGANIC MATTER RESERVES AND RATE OF DEGRADATION IN KILIYA DELTA OF DANUBE

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 5, Sep-Oct 84  
(manuscript received 27 Dec 83) pp 72-78

BASHMAKOVA, I.Kh., Institute of Hydrobiology, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] BOD studies were conducted on the waters in the Kiliya Delta to assess the levels of degradable organic matter. The study revealed extensive reserves of organic matter, much greater than in other Soviet waters. In the early and late seasons of the year BOD was largely accounted for by detritus-bound microbial flora, while, in the winter and summer, microcolonies and dispersed bacteria accounted for most of the oxygen consumption. In the summer, a 7-day turnover time was calculated for the degradable organic matter, with the reserves of degradable organic matter ranging from 1.41 to 7.24 mg C/liter in the different sampling areas of the Kiliya Delta.

Figures 1; references 22: 20 Russian, 2 Western.

[1593-12172]

UDC 574.64:(591-105:596.373.31)

PHENOL ACCUMULATION IN HOG SLATER

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 5, Sep-Oct 84  
(manuscript received 11 Apr 83) pp 42-45

ERBEN, R., Zagreb University, Yugoslavia

[Abstract] The hog slater (*Asellus aquaticus*) was tested for phenol accumulation at 19°C and pH 7-8, to evaluate this species as a potential biological indicator of water pollution. The death rate was found to be linear with increasing concentration of phenol in the water, giving an LD<sub>50</sub> = 40 mg/liter and an LD<sub>100</sub> = 80 mg/liter after 6 days of exposure. Accumulation per se was highly variable and dependent on the balance of intake and excretion. In general, maximum accumulation was seen to occur on the second day, with fluctuations thereafter. In chronic or long-term experiments, the lethal threshold concentration was calculated at 20 µg/g wet weight). Figures 1; references 9: 1 Yugoslav, 5 Russian, 3 Western.  
[1593-12172]

## EPIDEMIOLOGY

### INCIDENCE OF PARAMYXOVIRUS ISOLATION FROM WILD BIRDS

Bratislava ACTA VIROLOGICA in Russian Vol 28, No 2, Mar 84 (manuscript received 28 Jun 83) pp 114-121

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Prague; <sup>\*</sup>Institute of Virology, Slovak Academy of Sciences, Bratislava,  
Czechoslovakia

[Abstract] The incidence of paramyxoviruses in wild birds of Western Slovakia was followed in the period 1978-1982, involving serologic analysis of a total of 910 cloacal washings. A total of 41 strains of avian paramyxoviruses were isolated (25 PMV-1 serotypes, 10 PMV-4, and 6 PMV-6) from 9 species of wild birds, largely waterfowl. PMV-1 viruses were isolated every year, while PMV-4 and PMV-6 were isolated only in the 1978-1980 period of the study, and represented the first such isolates in Europe. Standard immunological and virological techniques were used to demonstrate the close antigenic similarity of the newly-isolated strains to PMV-4/Duck/Hong Kong D 3/75 and PMV-6/Duck/Hong Kong 311/80. In addition, hyperimmune rat anti-serum was used to demonstrate partial cross-reaction between PMV-4 and the parotitis virus. Electron micrographs of the isolates confirmed their typical paramyxovirus morphology. Figures 5; references 13: 3 Russian, 10 Western. [1631-12172]

UDC 577.323:578.841.1

PHYSICAL CHEMICAL CHARACTERISTICS OF NUCLEAR POLYHEDROSIS VIRUS DNA FROM  
GYPSY MOTH (PORTHETRIA DISPAR)

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 6, Nov-Dec 84  
(manuscript received 24 Apr 84) pp 614-619

CHEREPENKO, Ye. I., MARTYNENKO, Ye.I. and KOK, I.P., Institute of Molecular  
Biology and Genetics, Ukrainian SSR Academy of Sciences, Kiev

[Abstract] Physical chemical studies were conducted on the DNA of the nuclear polyhedrosis virus isolated from gypsy moth (*Porthetria dispar*) caterpillars, as part of a research effort on the replication of circular DNA duplexes. The caterpillars were collected in the Kiev Oblast of Ukraine. Fractionation of the DNA from inclusion bodies in a  $\text{CsCl}_2$  density gradient and electron micrography revealed covalently-closed ring forms, extended chains, and superhelical DNA in the presence of ethidium bromide.  $C_0t_{1/2}$  measurements yielded a value of 0.2, corresponding to ca. 100 megadaltons as the MW of the viral genome. Determinations on the GC content of the cellular and viral DNA on the basis of buoyant density determinations and melting temperatures yielded respective values of 38-40 mole% and 61-65 mole%. Thus, the difference of 26% in the GC-pair content of the viral and cellular DNA, and the large size of the viral genome, point to density gradient ( $\text{CsCl}_2$ ) ultracentrifugation as a convenient method for the separation of gypsy moth and viral DNA, as well as the convenience of using this virus as a model for studying genome replication of baculoviruses. Figures 5; references 12: 7 Russian, 5 Western.

[1650-12172]

STRETCHED POLYTENE CHROMOSOMES, DNA MICROCLONING METHOD AND GENE ENCYCLOPEDIA  
IDEA

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR. SERIYA  
BIOLOGICHESKIKH NAUK in Russian vyp 2, No 13, Aug 84 (manuscript received  
15 Feb 84) pp 52-55

ZAYNIYEV, G. A., Institute of Cytology and Genetics, Siberian Department,  
UUSR Academy of Sciences, Novosibirsk

[Abstract] Molecular methods of DNA research have developed so-called gene technology that makes possible cloning and subsequent analysis of primary DNA sequencing. The present article reports on study of DNA of polytene chromosome disks as they are transmitted into a "bank" of cloned DNA fragments while the "print" of each disk's cytological and genetic pattern is preserved. The basic ideas of stretching the polytene chromosome, microcloning of DNA and developing an encyclopedia of genes are summarized. Stretching is used to facilitate reading of gene information in each chromosome and separation of DNA from disk segments for cloning purposes. It fills the gap between cytological and molecular methods of DNA research. The procedures of microcloning, involving microscopic surgical operations, are described, and methods for developing a gene encyclopedia and the inventory for such an undertaking are summarized. Figures 3; references 10: 4 Russian, 6 Western.

[082-12131]

## GENE ENGINEERING

Vilnius KOMMUNIST in Russian No 9, Sep 84, pp 61-70

YANULAYTIS, A., candidate of biological sciences, head of Department of Scientific-Industrial Association "Fermentas" USSR Council of Ministers  
Laureate

[Abstract] This general discussion of gene engineering briefly describes its emergence, essence and possible hazards associated with it. Some contributions of gene engineering and bioengineering to industry, agriculture and medicine are presented and discussed briefly. A brief account of aspects of bioengineering in Lithuania emphasized the activity of the Scientific-Industrial Association "Fermentas".

[152-2791]



## CYTOGENETICS OF WHEAT-RYE HYBRIDS

Baku DOKLADY AKADEMII NAUK AZERBAYDZHANSKOY SSR in Russian Vol 40, No 7, Jul 84 (manuscript received 24 Dec 81) pp 70-73

MEZHLUMOV, F.K. and MAMEDOV, M.I., Institute of Genetics and Breeding, Azerbaijan SSR Academy of Sciences, Baku

[Abstract] Cytogenetic studies were undertaken on wheat-rye hybrids to assess chromosomal behavior in the different meiotic stages. The studies were conducted on the first filial generations of Bezostaya-1 wheat crossed with K-8203 and K-10154 rye. In the Bezostaya-1 x K-8203 hybrids in meiosis I at the tetrad stage 18.0% normal tetrads were formed, whereas in the Bezostaya-1 x K-10154 hybrids 21.5% of the cells were normal. In both cases ca. 59% of the cells showed micronuclei. The analytical data indicated that chromosomal conjugation involved homologous wheat chromosomes, and in individual cases represented autosynthesis of rye chromosomes. References 7 (Russian).  
[1640-12172]

## IDENTIFICATION AND ISOLATION OF LYMPHOCYTIC ANTIGENS OF CATTLE BY MEANS OF MONOCLONAL ANTIBODIES

Leningrad TSITOLOGIYA in Russian Vol 26, No 9, Sep 84 p 1070

KAYRITE, I. P. and MAURITSAS, M. M., Institute of Biochemistry, LitSSR Academy of Sciences, Vilnius

[Abstract] Surface antigens of blood lymphocytes from healthy cattle and from animals with leukemia were studied using MKA I, AII and G9. MKA producing cell lines were obtained by hybridization of NS-1 cells with spleen lymphocytes of Balb/c mice immunized with lymphocytes from the blood of a cow with leukemia; MKA AI and AII were isolated from the ascites and MKA G9 from the culture medium. It was found that lymphocytes of healthy and sick animals bound all three types of the MKA's used. Further study showed that MKA AII reacts with antigens with MW 53,000 Dalton and 43,000 Dalton and MKA G9 -- with antigens with MW 50,000, 35,000 and 16,000 Daltons.  
[075-7813]

## PRODUCTION OF MONOCLONAL ANTIBODIES TO PIG ERYTHROCYTES

Leningrad TSITOLOGIYA in Russian Vol 26, No 9, Sep 84 pp 1070-1071

KOZHUKHAROVA, I. V., ZAVOL'NAYA, Ye. S., PAN'SHIN, A. G. and IGNATOVA, T. N.,  
Institute of Cytology, USSR Academy of Sciences; Institute of Traumatology  
and Orthopedics, Leningrad

[Abstract] Conditions for obtaining hybridomas producing antibodies to pig erythrocytes were analyzed: Balb/c mice were immunized three times IP or once IM followed by two courses IP using  $10^8$  erythrocytes per mouse. Their splenocytes were hybridized with mouse myeloma cells. The number of cell lines producing antibodies was higher with the triple IP immunization. The Ig content in the culture medium changed as follows: during the increase of the cells from  $0.5 \times 10^3$  to  $5 \times 10^3$ , the agglutination reaction intensified, while further cell growth led to a loss of activity. In one test, a maximum number of antibody-producing clones (33%) was observed 24 hrs after cell hybridization; most of these clones lost their activity after 35 days.  
[075-7813]

## INSERTION OF PLASMID CONTAINING BACTERIAL GENE OF DIHYDROFOLATEREDUCTASE INTO MOUSE OVICELL AND INTO TERATOCARCINOMA CELLS

Leningrad TSITOLOGIYA in Russian Vol 26, No 9, Sep 84 p 1083

TITOMIROV, A. V., APRELIKOVA, O. N., ARKHANGEL'SKAYA, I. B., GALINSKIY, G. F., SEKIRINA, G. G., KHOZHAY, L. I., VAYSMAN, B. L., DYBAN, P. A., STEPANYAN, L. I. and TOMILIN, N. V., Institute of Cytology, USSR Academy of Sciences; Institute of Experimental Medicine, USSR Academy of Medical Sciences, Leningrad

[Abstract] Studying the integration and expression of prokaryotic gene of dihydrofolatereductase (DHFR) in differentiated cells of mice, two approaches were taken: 1) microinjection of the plasmid carrying DHFR gene into fertilized oviducts followed by analysis of late embryos and 2) introduction of this plasmid into transplanted teratocarcinoma cells followed by selection of the transformant clones using in vivo methotrexate. Analysis of DNA (approach 1) identified fragments of starting plasmid in chromosomal DNA. In one embryo, methotrexate resistant DHFR activity was identified. Several teratocarcinoma subclones were isolated which could be supported without selective pressure and found to contain plasmid DNA. However, none of them exhibited the expression of bacterial gene of DHFR. Re-transformation of E. coli from one of the clones yielded several transformed plasmids which lost the DHFR gene.  
[075-7813]

# PROTEIN AND TRYPTOPHAN LEVELS IN CERTAIN WHEAT, RYE AND WHEAT/RYE HYBRID VARIETIES

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 114, No 2, May 84 (manuscript received 11 Feb 83) pp 373-376

GOL'DENBERG, Z.V., Institute of Botany, Georgian SSR Academy of Sciences

[Abstract] Tabular data are presented on the grain protein and tryptophan concentrations of several varieties of wheat, rye and wheat/rye hybrids, with a view toward selection of optimum varieties for cultivation. In the Zanduri wheat population there was an inverse correlation between total protein and tryptophan levels, with *Triticum monococcum* v. *hornemanni* analyzed for 12.8% protein and 0.750 mg tryptophan, and *T. zhukowski* yielding respective values of 16.0% and 0.385 mg. The total protein and tryptophan levels in rye were much lower than in the various wheat varieties, with *Secale montanum* showing the highest protein (11.4%) and tryptophan (0.160 mg) values. Analysis of hybrids demonstrated that the optimum cross consisted of *T. dicoccoides* x *S. montanum*, yielding a total protein content of 17.8%, and a tryptophan concentration of 0.210 mg. References 10: 8 Russian, 2 Western.  
[1585-12172]

# CYTOGENETIC ANALYSIS OF AEGILOPS-WHEAT F<sub>1</sub> and F<sub>2</sub> HYBRIDS

Baku DOKLADY AKADEMII NAUK AZERBAYDZHANSKOY SSR in Russian Vol 40, No 6, Jun 84 (manuscript received 13 [ ] 81) pp 66-71

RASI-ZADE, G.M., Institute of Genetics and Selection, Azerbaijan SSR Academy of Sciences

[Abstract] Cytogenetic analyses were conducted on the meiotic stages of first and second filial generations of aegilops-wheat hybrids as part of a study to obtain highly productive grain crops. The F<sub>1</sub> hybrids were obtained by crossing *Aegilops avata* with *Triticum durum*, and backcrossing to obtain the F<sub>2</sub> generation. The somatic cells of both generations had 28 chromosomes. Analysis of the meiotic stages of the F<sub>1</sub> and F<sub>2</sub> hybrids showed that the number of cells with chromosomal abnormalities ranged from ca. 62 to ca. 89% in the F<sub>1</sub> hybrids, and from ca. 52 to 62.5% in the F<sub>2</sub> generation. The aberrations observed in metaphase I, anaphase I, telophase I, anaphase II, telophase II and tetrad formation with micronuclei were ascribed to functional disruptions involving the spindle mechanism. Figures 2; references 13: 7 Russian, 1 Hungarian, 5 Western.  
[1639-12172]

## HUMAN FACTORS

BOOK: ENGINEERING PSYCHOLOGY; ECONOMIC PROBLEMS, BY SMIRNOV, B. A., DUSHKOV, B. A., AND KOSMOLINSKIY, F. P., Moscow, Ekonomika, 1983 224 p.

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 165-167

ZABRODIN, Yu. M., doctor of psychological sciences and ZAZYKIN, V. G., candidate of psychological sciences

[Abstract] This review of Inzhenernaya psikhologiya: ekonomicheskiye problemy reviews previous related books on machines and human psychology, then turns to stress the value of the given book in offering numerous concrete examples as guidelines for a methodology for determining economic impact and effectiveness of various degrees of automation and computerization in industry, transportation and communications. Chapters of the book are devoted to a general survey of the field, methodology and classification, planning and use of computers, productivity increases and work standards, efficiency and reliability, personnel selection and training, and social implications of engineering psychology. While the scholarship and accuracy of the work receive praise, the title is seen as not reflecting the book's content, and some topics that the title implies should have been included have been left out. Also, the authors' attempts to provide chapter abstracts are regarded as unsuccessful. Yet, the reviewers feel the shortcomings are not fundamental, and its value for students and already trained specialists in the field is high.

[097-12131]

VALUE OF INTRADERMAL TEST IN Q FEVER CONVALESCENTS AND VACCINATED SUBJECTS  
AS INDICATOR OF EXPOSURE AND OF ANTIBODY FORMATION

Bratislava ACTA VIROLOGICA in Russian Vol 28, No 2 Mar 84 (manuscript  
received 18 Mar 83) pp 134-140

KAZAR, J., SCHRAMEK, S. and BREZINA, R., Institute of Virology, Slovak  
Academy of Sciences, Bratislava, Czechoslovakia

[Abstract] A chemically-prepared *C. burnetii* vaccine was employed in the evaluation of the indicator value of the intradermal test in assessing exposure to *C. burnetii* and antibody formation. The studies were carried out on individuals with a history of Q fever 1 to 11 years ago, and on subjects vaccinated within the past three months to four years. The intradermal test was found to be a more sensitive indicator than the microagglutination test in terms of positive results. In addition, microagglutination tests conducted at the time of the intradermal test and two weeks later showed positive seroconversion as a result of the test, as well as an increase in antibody titers against both phases of *C. burnetii*. The increase was similar in both groups of subjects, but in the vaccinated individuals it was encountered more frequently in cases with a positive intradermal test than with negative results. The intradermal test results showed good correlation with lymphocyte transformation tests at various post-vaccination times, but not with leukocyte migration inhibition tests. References 19: 6 Russian, 1 Czech, 3 Slovak, 9 Western.  
[1631-12172]

IN VIVO INHIBITION OF FLAVIVIRUS-INDUCED T-SUPPRESSORS OF AUTOREACTIVE  
T LYMPHOCYTES BY INTACT MOUSE SERUM

Bratislava ACTA VIROLOGICA in Russian Vol 28, No 3, May 84 pp 212-217 (manuscript received 8 Jul 83) pp 212-217

KHOZINSKIY, V.V. and SEMENOV, B. F., Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow

[Abstract] Studies with inbred mouse lines led to the identification of a mouse serum factor(s) (SF) in normal mice which is capable of in vivo

inhibition of T suppressors of autoreactive T lymphocytes induced by infection with flaviviruses. Activity was evident only in those situations in which the autoreactive T cells shared completely or partially the H-2 antigens of the serum donor. The inhibitory activity of the SF was not predicated on the destruction of the T-suppressor cells, and in vivo inhibition was lacking in the case of suppressors induced by tick-borne encephalitis virus that were directed against allogeneic lymphocytes responsible for graft-versus-host reaction in the recipient. The nonsusceptible suppressor cells were identified in the thymus, lymph nodes and the spleen, while susceptible T-suppressors were found limited to the thymus and the lymph nodes. The identification of SF in the sera of normal mice may indicate that such factors constitute yet another aspect of the ongoing immunoregulatory process that inhibits the appearance of functional autoreactive immunocompetent cells. References 14: 5 Russian, 9 Western.  
[1633-12172]

## LASER EFFECTS

UDC 621.373.826:577.3

### ANALYSIS OF NON-LINEAR ABSORPTION CHANGES IN REACTION CENTERS OF PHOTO-SYNTHESIZING BACTERIA AFTER SELECTIVE EXCITATION BY POWERFUL LASER PULSES

Moscow KVANTOVAYA ELEKTRONIKA in Russian Vol 11, No 10, Oct 84 (manuscript received 11 Oct 83) pp 1965-1969

VALKUNAS, L., GAYZHAUSKAS, E. and GALKUTE, L., Institute of Physics, LitSSR Academy of Sciences, Vil'nyus

[Abstract] Study of non-linear effects in absorption changes of reaction centers, guided by a powerful picosecond laser pulse at a wave-length corresponding to the absorption maximum of the photodonor bacteriochlorophyll is described and discussed. A simplified 4-level scheme showed that changes in optical density of the system in the region of maximal intensity do not depend on the phase memory parameter. Results of numerical calculation of non-linear changes of optical density of the reaction center agreed quantitatively with results of experimental calculations and were sensitive to variation of both the phase relaxation time and to the dipole moments of optical transitions of the molecules which absorb the exciting radiation. Possibility of determining these parameters was demonstrated. Figures 2; references 9: 3 Russian, 6 Western.  
[150-2791]

UDC 617.7-616-06-615-.617.735

### RUBY LASER IN PREVENTION OF POSTTRAUMATIC RETINAL SEPARATION

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 4, Apr 84 pp 40-42

BERENOV, S.N., Turkmen Scientific Research Institute of Eye Diseases

[Abstract] An analysis was conducted of the therapeutic effectiveness in management of post-traumatic retinal detachment, employing a group of 28 subjects (28 eyes) with penetrating wounds of the eyeball. The patients ranged in age from 10 to 46 years, with duration of ocular damage ranging from several days to 1.5 years. Light coagulation was effected with ruby

laser OK-2 (0.05-0.1 J). Following treatment, most patients were without serious complications, but in 4 cases preretinal point hemorrhages were observed. In 20 patients, visual function remained unchanged, while in 8 cases visual acuity improved by 0.02-0.4 units. Only one case of retinal detachment (due to hemophthalmus) occurred in 22 cases followed for 6 months to 3 years. On the basis of this study, it appears that laser coagulation can be an effective means of preventing post-traumatic retinal separation. References 9: 7 Russian, 2 Western.  
[092-12172]



## MARINE MAMMALS

### DOLPHINS--INTELLECTUALS OF SEA

Moscow IZVESTIYA in Russian 8 Oct 84 p 6

KREYN, Irma, senior scientific staff member, Institute of Cybernetics, Ukrainian SSR Academy of Sciences, Kiev, in the column "Izvestiya Science Club."

[Abstract] This article describes the reactions of a scientist to a science-fantasy television program entitled "Man and Dolphin." The film told the story of Sergey Chernikov, a scientist who devoted his life to the problem of proving that dolphins are a species equal to man and not an organism ranked either just above or below apes. Fantasy writers have repeatedly dealt with this topic, and have generally given dolphins the capacity of human speech, which has often been used as the criterion for intelligence. The main error in determining criteria for intelligence has been the search for one such criterion, whereas intelligence is based on a variety of characteristics specific for various habitats of intelligent life forms. These characteristics include the capacity for unlimited accumulation of experience, i.e., retention of past experiences and acquisition of new ones. This represents a cybernetic approach to defining intelligence and can be applied to the problem of contact between man and dolphin, as well as between man and extraterrestrial life forms. The hero of the TV film doesn't even attempt to speak with dolphins, but finds another way of reaching their "spiritual world." Chernikov represents a scientist who devotes his life to a specific problem and thus serves as a good example for young people interested in science as a career. Other positive aspects are Chernikov's realization that all means for attaining a goal are not necessarily good and his refusal to act contrary to his moral and ethical standards. The film is about continuity in science, the romance of science, as well as the efforts of scientists to understand each other.

[049/A-9307]

MEDICINE

UDC: 614.8(575.1)

INJURIES AMONG POPULATION OF UZBEK SSR AND MEASURES TO REDUCE THEM

Tashkent MEDITSINSKAYA ZHURNAL UZBEKISTANA in Russian No 9, Sep 84 (manuscript received 8 Jul 83) pp 3-5

SEMENYUTA, A. Ya., and KHASANOV, T.A., candidates of medical sciences, Scientific Research Institute of Traumatology and Orthopedics, Uzbek Ministry of Health

[Abstract] Analysis of traumatism in the republic over 3 years indicates that domestic injuries amount to 63%, accidents in the street 17%, highway accidents 7%, school accidents 3%, sports accidents 2% and other accidents 8% of injuries to adults. The problem of preventing injuries to children is a pressing one. A republic interdepartmental commission on decreasing and preventing injuries of children has been in operation since 1972. However, traumatism among children has not decreased, some types of injuries even significantly increasing. Domestic injuries of children are particularly alarming, amounting to 80% of all injuries when combined with accidents in the street not related to traffic accidents. Improved safety education and safety conditions at work will decrease accidental injuries; antialcohol propaganda, social work, proper education of children, timely diagnosis of nervous and mental disease and education concerning the proper habits are the main means for reducing avoidable injuries. Strict observation of rules and discipline in sports and careful medical examinations can reduce sports injuries.

[1607-6508]

## PHOTODERMATOSES

Tashkent MEDITSINSKAYA ZHURNAL UZBEKISTANA in Russian No 9, Sep 84 (manuscript received 20 Jun 83) pp 46-50

BELUKHA, U. K., Scientific Research Institute of Skin and Venereal Diseases, Uzbek SSR Ministry of Health

[Abstract] Photodermatoses are rather common in the hot climate of Uzbekistan, being seasonally aggravated in the spring and summer and decreasing in frequency and severity in fall and winter. Abnormal sensitivity to light may be caused by vitamin deficiency, metabolic or endocrine disorders. Studies have distinguished two major forms of photodermatosis: acute and chronic recurring dermatosis. Clinical descriptions of various forms of photodermatosis have been composed and methods determined for treatment. Significant changes in metabolism of metals and salts have been observed in photodermatosis patients. In the light of current concepts of participation of a photoallergic component in the pathogenesis of certain photodermatoses, a combined study is planned for the next 5 year plan period, of humoral and cellular immunity disorders and their relationship with certain biochemical changes, the degree of morphologic and functional injury to the skin.

References: 14 Russian.

[1607-6508]

UDC 615.837.3-089:576.8.095.87

## MICROBIAL EFFECTS OF LOW-FREQUENCY ULTRASOUND

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 114, No 2, May 84 (manuscript received 18 Feb 83) pp 429-432

OGANESYAN, M. A., Yerevan State Medical Institute

[Abstract] In following up on earlier reports on the use of ultrasound in the management of infected wounds, the present studies were conducted at the Yerevan Medical Institute to evaluate the effects of low-frequency ultrasound (26.5 kHz) in the management of 58 cases of infected wounds, and 72 cases of peritonitis in which the peritoneal cavity was irradiated. The ultrasound was found to sterilize the irradiated field in 56.32% of the cases, and markedly diminished the growth of *S. aureus* and *E. coli* in the remaining cases. In addition, antibiotic susceptibility of the cultured microorganisms was found to be enhanced, and many cases were observed of conversion of pathogenic to nonpathogenic staphylococci. Low-frequency ultrasound, therefore, appears to be a promising therapeutic modality in the treatment of wounds and surgical cases at risk of infection. References 5 (Russian).

[1585-12172]

## MICROBIOLOGY

### PROSPECTS FOR USE OF SILICON MICROORGANISMS

Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 2 Dec 84 p 4

SVINTITSKIY, Yu., Odessa [abstract of Article entitled "What is There around the Bend"]

[Abstract] Professor Vasiliy Gerasimovich Aleksandrov discussed some prospects of use of silicate bacteria. It is now known that these bacteria synthesize their own biomass by assimilating carbon and nitrogen from the atmosphere and they take phosphorus and silicon from minerals, i.e., from sources of nutrition inaccessible to other organisms. They have an enzymic system which can perform miracles; they "eat" and destroy silica and silicates and transform them into a soluble state. The mechanism of absorption of silicon by these bacteria and conversion of its inorganic compounds into organic compounds is now known and this knowledge of the mechanism of functioning of silicate bacteria promises a new inexhaustible source of energy. New, non-traditional methods of extracting energy from stones which are now only inert ingredients in coal are being developed. Scientists are studying the possibility of using silicate bacteria to enrich previously unusable ores. Professor Aleksandrov is very interested in discovering new possibilities of the use of silicate bacteria in agriculture. They may be a valuable source of protein. They can decompose cellulose and transform it into assimilable carbohydrates, in the animal body itself. Biomass produced by silicate bacteria has been used as animal fodder and is producing a high economic impact due to increased yields. Application of preparations based on silicate bacteria to vineyards produced half-ton increases in yield per hectare. These bacteria are being used in treating silicosis. Aerosols based on them convert silica dust in the lungs into a soluble state and that new material can be eliminated from the body. Possibility of extra-terrestrial existence of silicate bacteria is also discussed.  
[1635-2791]

## RICKETTSIAS AND CHLAMYDIA: COMPARATIVE ELECTRON MICROSCOPIC CHARACTERISTICS

Bratislava ACTA VIROLOGICA in Russian Vol 28, No 3, Mar 84 (manuscript received 1 Jun 83; in final form 1 Aug 83) pp 159-172

AVAKYAN, A.A. and POPOV, V.L., Laboratory of Microbial Anatomy, Scientific Research Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Comparative ultrastructural studies were conducted on the structure, cytopathology and host-parasite interactions of rickettsias and chlamydia. On the basis of such observations, rickettsia-like and chlamydia-like characteristics were delineated and described. The former elaborate short, rod-like, cells that multiply freely (outside of vacuoles) in the cytoplasm or the nucleoplasm of the host, while the chlamydia-like descriptor indicates spherical cells that multiply within cytoplasmic vacuoles limited by a host membrane. The rickettsia-like designation encompasses the Rickettsia genus and symbionts of the Wolbachia and Symbiotes genera. The chlamydia-like organisms encompass the genera Chlamydia, Ehrlichia, Cowdria, and Neorickettsia. In addition, transitional types have been identified as type-Wolbachia persica and type-Coxiella and Rickettsiella. The authors contend that the chlamydia and rickettsias should be placed in a new class designated Intracytobiotics. Figures 7; references 65: 25 Russian, 40 Western.  
[1631-12172]

UDC (576.8:593.4) (26)

## MICROFLORA OF BLACK SEA SPONGES

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 5, Sep-Oct 84 (manuscript received 30 Jun 81) pp 32-35

NIZHEGORODOVA, L.Ye., KAMINSKAYA, L.D. and TEPLINSKAYA, N.G., Odessa Department, Institute of Biology of Southern Seas, Ukrainian SSR Academy of Sciences

[Abstract] An evaluation was conducted on the bacterial flora of Black Sea sponges collected between 1974 and 1978 from the Northwestern and the Northeastern regions of the Ukrainian shelf zone. Analysis of sponge genera (Dysidea fragilis, Haliclona implexa, H. cinerea, H. ascidia, Halichondria panicea) showed that most of the saprophytic bacteria consisted of asporogenous bacilli, such as Bacterium, Chromobacterium and Mycobacterium, while the potential pathogens were largely represented by Citrobacter, Proteus and Escherichia. Tabular data are presented on actual counts per gram, which indicated that the potential pathogens ranged in numbers from a few cells to tens of thousands, while the minimum number of nonpathogenic saprophytes commenced with a figure in the thousands. Changes in the number of bacteria carried by the sponges were seasonal in nature and depended in part on wind factors. References 18: 9 Russian, 9 Western.  
[1593-12172]

EFFECTS OF SUB-BACTERIOSTATIC ANTIBIOTIC CONCENTRATIONS ON CHOLERA VIBRIO VARIABILITY

Moscow ANTIBIOTIKI in Russian Vol 29, No 10, Oct 84 (manuscript received 11 Apr 84) pp 770-775

ANDRUSENKO, I.T., VED'MINA, Ye.A., GIVENTAL', N.I., PASTERNAK, N.A., ALEKSANDROVA, I.K., SHENDEROVICH, V.A., KORESHKOVA, Ye.A., SHEPELEV, A.P. and SOBOLEV, V.R., Rostov-on-Don Institute of Epidemiology, Microbiology and Hygiene; Central Institute for the Advanced Training of Physicians, Moscow

[Abstract] Ten strains of *V. cholerae* Inaba were exposed to sub-bacteriostatic concentrations of antibiotics (tetracycline, erythromycin, ampicillin, novobiocin, benzylpenicillin, or polymyxin) to determine the effects of such exposures on the biological characteristics of the microorganisms. Prior to the study, the strains in question were fully or moderately susceptible to these antibiotics. Subsequent analysis of a number of bacterial characteristics showed that even a single exposure to low antibiotic concentration was sufficient to alter the antigenicity, phage susceptibility, and toxigenicity of the vibrios. The alterations were stable changes retained for a number of passages on synthetic media, and for at least ten passages in suckling mice. It remains to be elucidated to what extent and in what manner genetic factors were involved in the changes resulting from such exposure, although genetic selection appears to be a logical conclusion as a first approximation. References 9 (Russian). [1590-12172]

DOXYCYCLINE IN EXPERIMENTAL RICKETTSIOSES

Moscow ANTIBIOTIKI in Russian Vol 29, No 10, Oct 84 (manuscript received 15 Apr 84) pp 775-780

KEKCHYEVA, N.G., Laboratory of Cytology and Infectious Immunity, Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR Academy of Medical Sciences, Moscow

[Abstract] Experimental clinical trials were conducted with doxycycline in guinea pigs infected either with *R. prowazekii* or *R. sibirica* to determine the effects of the antibiotic on the immune system. Additional studies were conducted with chick embryos infected with these and other species of rickettsia, and all data were assessed in comparison with the effects of tetracycline. In the guinea pig studies, doxycycline was found to be more effective against *R. prowazekii* than against *R. sibirica*, but exceeded the potency of tetracycline in both cases. Doxycycline was effective in controlling hyperthermia, especially in the case of *R. prowazekii*, and, when

administered in the incubation period (1-5 mg, per os) and for 6-9 days thereafter completely abrogated the infectious process due to *R. prowazekii*. Doxycycline did not significantly alter the course of infection with *R. sibirica* in the guinea pigs, despite its rickettsiocidal effects in the chick embryo model. References 5: 2 Russian, 3 Western.  
[1590-12172]

UDC 632.937.14:633.71

#### THRIP-ATTACKING ENTOMOPATHOGENIC FUNGUS

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 114,  
No 2, May 84 (manuscript received 25 Feb 83) pp 417-420

TSINTSADZE, K.V., MZHAVANADZE, Zh.I., ZIL'BERMINTS, I.V. and VARTAPETOV, S.G., All-Union Scientific Research Institute of Phytopathology, USSR Ministry of Agriculture

[Abstract] Further description is provided of a fungus which attacks thrip. It was isolated in a greenhouse in the Kabuletskiy Rayon of Adzharian ASSR in 1977. The fungus has been identified as *Entomophthora parvispora* and is similar to, but differs in host specificity from, *E. adjarica*. On infection with *E. parvispora* the thrip host loses its luster and becomes less motile. Death follows within 4-6 days of infection with the thrip becoming mummified and assuming a light-yellow color if conidia are present, or a black color if resting spores develop. *E. parvispora* has not yet been cultivated in vitro, but can be maintained on a year-round basis on tobacco thrip without sporulation when the temperature is kept to 22-25°C with a relative humidity above 80%, and a 16 h period of illumination. Figures 6; references 5: 1 Polish, 1 Russian, 3 Western.  
[1585-12172]

NONIONIZING ELECTROMAGNETIC RADIATION EFFECTS

UDC 617.713-007.17-036.11-085.847.8

USE OF VARIABLE MAGNETIC FIELD IN TREATING ACUTE KERATOCONUS

Moscow VESTNIK OPTAL'MOLOGIIYA in Russian No 5, Sep-Oct 84 (manuscript received 25 Aug 83) pp 44-46

VAYNSHTEYN, Ye.S., professor, KIVAYEV, A.A., BABICH, G.A., ZOBINA, L.V. and ABUGOVA, T.D., Moscow Scientific Research Institute of Eye Diseases imeni Hel'holtz (director K.V. Trutneva)

[Abstract] This is a report of use of a variable magnetic field produced by the Soviet Polyus-1 low-frequency magnetotherapy device in treatment of acute keratoconus. It involved observation of 21 persons (23 eyes) ranging in age from 16-31 years, with acute keratoconus--who had had the diseases less than 1-2 years before beginning of treatment--and selection of 14 of these persons (15 eyes) for variable magnetic field therapy. Early inclusion of this therapy into the complex of therapeutic measures used to treat acute keratoconus improved the effectiveness of medical treatment, made out-patient treatment possible and promoted earlier rehabilitation of these patients with the aid of contact lenses. References 13: 7 Russian, 6 Western. [1646-2791]



UDC 615.339:578.245].015.4.07

EXPERIMENTAL STUDIES ON INTERFERON INDUCTION AND ANTIVIRAL ACTIVITY OF  
SELECTED BIOACTIVE SUBSTANCES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript  
received 17 Nov 83) pp 549-553

KREMERMAN, I.B., PRIYMYAGI, L.S. and YERSHOV, F.I., Tallinn Scientific  
Research Institute of Epidemiology, Microbiology and Hygiene, Estonian  
SSR Ministry of Health; Institute of Virology imeni D.I. Ivanovskiy,  
USSR Academy of Medical Sciences, Moscow

[Abstract] Outbred albino mice were employed in studies on the effects of  
the route of administration, dosages and various combinations of tilorone, its  
congener IS-32, zymosan, prodigiosin, and kutizon [cumialdehyde thiosemicarba-  
zone] on interferon production and antiviral effectiveness (prophylactic  
and therapeutic). Prodigiosin failed to induce interferon formation either  
alone or in combination with the Soviet inducer polyguacyl (synthetic complex  
of polyguanylic acid + polycytidylic acid). The other agents were effective  
in interferon induction (40-640 IU<sub>50</sub>/ml), with the highest activity exhibited  
by tilorone (320-640 IU<sub>50</sub>/ml). In addition, tilorone, prodigiosin and  
zymosan were effective antivirals with respect to influenza, while the com-  
bination of zymosan and polyguacyl was also effective against tick-borne  
encephalitis in the mice. In general, interferonogenic activity and  
antiviral effectiveness were predicated on the dose, route of administration,  
and schedule of injection. Figures 1; references 14: 12 Russian, 2 Western.  
[1586-12172]

## PHYSIOLOGICALLY ACTIVE POLYMERS

Tashkent MEDITSINSKAYA ZHURNAL UZBEKISTANA in Russian No 9, Sep 84  
(manuscript received 15 Jun 84) pp 54-60

ZAKIRGV, U. B., Department of Pharmacology, Tashkent Order of Labor Red  
Banner State Medical Institute

[Abstract] A discussion is presented of polymers used for the creation of new types of medications--medicinal polymers. The physiologically active substances are divided into two groups. Those whose activity appears only at the macromolecular level, and those which consist of a combination of a physiologically inert polymer carrier and a physiologically active low molecular weight or high molecular weight compound. Data are presented on physiologically active polymer substances used in medicine or suitable for such uses. They include neutral polymers such as blood substitutes, polycations and polyanions, as well as poly-N-oxides of tertiary amines such as poly-2-vinylpyridine-N-oxide which has antisilicotoxic properties; iodophors, which have bactericidal effects; and graft-type polymers, which carry physiologically active substances on inactive polymers. Polymer derivatives of the antibiotic ampicillin have been found to be 40 times more active than the initial antibiotic for microorganisms producing penicillinase. Significant success has been achieved mostly in the area of the search for, study and introduction to practice of physiologically active polymers. References 19: 16 Russian, 3 Western.  
[1607-6508]

UDC 616.45-001.1/.3:615.23

EFFECTS OF STRESS AND PSYCHOTROPIC AGENTS ON CEREBRAL  $Mg^{2+}$ -ATPase ACTIVITY IN RAT

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 6, Nov-Dec 84  
(manuscript received 28 May 84) pp 637-641

KRESYUN, V.I., Odessa Medical Institute imeni N.I. Pirogov

[Abstract] Tissue respiration and oxidative phosphorylation were studied in various brain tissues (cortex, limbic system, medulla oblongata) of 5-month old Wistar rats, in an evaluation of the effects of emotional/pain stress and psychotropic agents. In long-term (12 days) experiments, stress enhanced oxidative phosphorylation during the first 3 days, with subsequent depression of oxidative phosphorylation and maximum uncoupling by day 12. The changes were most pronounced in the cortical and limbic tissues, while the metabolism of the medulla oblongata was least affected. Concomitantly, the levels of ADP and ATP decreased, while the concentration of AMP increased. Determinations of  $Mg^{2+}$ -ATPase activities revealed stress-induced depression

on the order of 42 and 46% in the cortex and the limbic system, respectively, and only a 12% loss of activity in the medulla. Pretreatment of the animals with average therapeutic doses of various tranquilizers (chlordiazepoxide, meprobamate, mebikar [sic]) or analogs of nicotinic acid or GABA (lironit [sic], nikogamol [sic], fenibut [sic]), showed that all agents, with the exception of chlordiazepoxide and meprobamate, were effective in preventing stress-induced depression of ATPase activity. It appears that such agents should be further investigated for potential use as anti-stress drugs. Figures 1; references 15: 1 Ukrainian, 6 Russian, 8 Western. [1650-12172]

UDC 616.831-005.1-07:616.831-073.97-02:615.23:547.496.3

#### EFFECTS OF GUTIMIN ON EEG AND CEREBRAL BLOOD SUPPLY IN CATS WITH INTRACEREBRAL HEMORRHAGE

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
(manuscript received 12 Oct 83) pp 36-39

PLOTNIKOV, M.B., KOROBOVA, Z.V. and CHERNYSHEVA, G.A., Chair of Pharmacology, Tomsk Medical Institute

[Abstract] Experimental trials were conducted on the effectiveness of gutimin [sic] in alleviating cerebrovascular pathology in cats with experimentally-induced intracerebral hemorrhage. Gutimin was administered intravenously 1-2 days after injection of 2 ml of autologous blood into the internal capsule of the right hemisphere. In untreated animals with the experimental hemorrhage, blood flow fell by 11-30% in the right cortex and other structures, in the face of insignificant changes in systemic BP and respiratory rate. The cerebrovascular insufficiency was accompanied by the dominance of high-amplitude slow waves on the EEG. Gutimin administration (50 mg/kg) enhanced the blood supply to the brain, with the most remarkable increase seen in the reticular formation of the midbrain: in the left hemisphere the blood flow increased by 8-25% from the 15th to the 120th min, and on the right side by 7-11% within 60 min of injection. Increased blood supply was also noted in the right visual cortex and the thalamus, areas close to the insult [stroke] site. The EEG pattern indicated activation with a decrease in the number of slow waves and an increase in the proportion of high-frequency rhythms. Studies with isolated blood vessels confirmed the impression that the alleviating effects of gutimin can be ascribed to direct vasodilatory mechanisms. Figures 2; references 13 (Russian). [1638-12172]

EFFECTS OF REDOX VITAMIN COMBINATION ON ACUTE HYPOXIA AND MYOCARDIAL ISCHEMIA

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 27, No 6, Nov-Dec 84  
(manuscript received 17 Aug 83) pp 46-50

SIDORENKO, A.F. and GATSURA, V.V., Chair of Pharmacology, Kursk Medical  
Institute; Scientific Research Institute for Biochemical Testing of  
Chemicals, Moscow

[Abstract] Dogs, rats and mice were employed in a series of studies on the protective effects of vitamins (ascorbic acid, riboflavin, lipoic acid, nicotinamide) with a high redox potential in hypoxic conditions and myocardial ischemia. The combination of vitamins, administered in a dose of 450 mg/kg, was most effective in survival studies on mice subjected to acute hypoxia (hyperbaric, normobaric, tracheal ligation), although the individual vitamins were also effective in some cases. In dogs with surgically applied myocardial ischemia, the vitamin combination was also effective in statistically increasing collateral circulation, without affecting systemic BP or the heart rate. Studies on the effects of the vitamin combination on the metabolism of mitochondria isolated from ischemic rat myocardia showed enhancement of oxidative phosphorylation coupling and, hence, formation of high energy compounds. These observations suggest that judicious use of selected vitamins or vitamin combination with high redox potentials may have therapeutic usefulness in hypoxic and ischemic situations. References 9: 7 Russian, 2 Western.  
[1638-12172]

EFFECTS OF DECANE-1,10-BIS(ACETOXY-(N,N)-DIMETHYL-(N)-(DI-PHENYLMETHOXY-2-ETHYL)AMMONIUM] DICHLORIDE ON RAT METABOLISM

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
(manuscript received 25 Oct 83) pp 60-63

KOVTUNYAK, N.A., MESHCHISHEN, I.F., BORDYAKOVSKAYA, L.G., RUSNAK, I.K.,  
POPIVCHUK, D.Z., SHAPLAVSKIY, N.V. and YARMOL'CHUK, G.M., Chair of Medicinal  
Chemistry, Chernovtsy Medical Institute

[Abstract] Outbred albino rats were employed in toxicity studies on a new compound with broad-spectrum anti-bacterial and anti-mycotic activity -- decane-1,10-bis(acetoxy-(N,N)-dimethyl-(N)-(diphenylmethoxy-2-ethyl)ammonium] dichloride (I). Intragastric administration of I in a dose of 5 mg/kg (5% of LD<sub>50</sub>) for 10 days inhibited hepatic glycolytic and the pentosephosphate pathways. However, examination of the enzyme activities 10 and 20 days after termination of the agent showed no significant changes, indicating that in

this respect the effects of I were reversible. Lipid metabolism was also significantly affected: total serum and hepatic phospholipids continued to increase even 20 days after the drug was withdrawn, while hepatic triglyceride levels continued to fall. I also depressed connective tissue levels of glycosaminoglycans. However, liver levels of total proteins and DNA and RNA were unaffected; similarly, serum and hepatic levels of urea were also unaffected. References 14: 1 Rumanian, 10 Russian, 3 Western.  
[1638-12172]

UDC 616.33-002.44-02:615.272.4.014.425]-092.9

# EFFECTS OF SYNTHETIC ANTIOXIDANTS IONOL AND DIBUNOL ON BLEEDING GASTRIC ULCERS IN RAT

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
(manuscript received 27 Oct 83) pp 87-90

VAYNSHTEYN, S.G. and ZVERSHKHANOVSKIY, F.A., Chair of Therapy, Faculty for Advanced Training of Physicians, Ternopol Medical Institute

[Abstract] Outbred white rats were employed in a study designed to assess the effectiveness of the synthetic antioxidants ionol [sic] and dibunol [sic] in the management of bleeding gastric ulcers and, indirectly, to evaluate the hypothesis that lipid peroxidation in the gastric mucosa may be a contributing factor in gastric ulcers. Administration of the agents (50 mg/kg, intragastric) as a liniment showed that they were without protective effects on the mucosal lesions induced by Shay's operation. Concomitantly, lipid peroxidation in the gastric mucosa was depressed by the administration of the antioxidants. Although these observations suggest that antioxidants have no therapeutic potential in the management of peptic ulcers and that, seemingly, lipid peroxidation may not be an etiologic factor in such lesions, the studies will have to be continued with other ulcer models for a definitive assessment. References 17: 9 Russian, 8 Western.  
[1638-12172]

EFFECTS OF SEA ANEMONE (RADIANTHUS MACRODACTYLUS) HEMOLYSIN ON  
CONDUCTIVITY OF BILAYER LIPID MEMBRANES

Moscow BIOLOGICHESKIYE MEMBRANY in Russian Vol 1, No 10, Oct 84 (manuscript received 5 Mar 84) pp 1019-1024

RUDNEV, V.S., LIKHATSKAYA, G.N., KOZLOVSKAYA, E.P., MONASTYRNAYA, M. M. and YELYAKOV, G.B., Institute of Chemistry, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok; Pacific Institute of Bioorganic Chemistry, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok

[Abstract] Studies were conducted on the effects of sea anemone (*Radianthus macrodactylus*) hemolysin on the conductivity of bilayer lipid membranes, in relation to the absence or presence of sphingomyelin in the membrane. Addition of the toxin to one side of the membrane or to the bathing fluid on both sides, resulted in a concentration-related increase in conductivity. Equivalent conductivities were achieved with smaller toxin concentrations if sphingomyelin was a constituent of the membrane, with a dose-response relationship applicable to the sphingomyelin content. The increase in conductivity was ascribed to transmembrane channel formation exhibiting preferential permeability for cations. Studies at 20-28°C led to calculations of energies of activation for channel formation on the order of 105 kJ/mole. The individual channels were long-lived (10-30 min) and exhibited volt-ampere asymmetry, with significantly greater conductivity evident when the membrane potential was positive on the side of toxin application. Since sphingomyelin has no effect per se on channel characteristics, it appears to only enhance hemolysin adsorption to the membrane surface. Figures 5; references 13: 4 Russian, 9 Western.

[1589-12172]

## PHYSIOLOGY

### FUNCTIONAL SYSTEM THEORY IN PRACTICE

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 15, No 4, Oct-Dec 84  
pp 119-124

SOSNOVSKIY, A.S.

[Abstract] An exhibition on "The Functional System Theory in Practice" was held in the pavilion at the Exposition of Achievements of the National Economy from September, 1983 to February, 1984. The exhibition dealt with the development and application of the Functional System Theory (FST) created by P.K. Anokhin. It was organized by the All-Union Problems Commission on "Mechanisms of Systemic Organization of Physiological Functions" of the Scientific Council of the USSR Academy of Sciences, and the USSR Academy of Medical Sciences commission on "Human Physiology", and by the Scientific Research Institute of Normal Physiology (SRINP) imeni P.K. Anokhin, USSR Academy of Medical Sciences. More than 40 institutes and educational and scientific establishments from across the USSR participated in the exhibition. In recent years the concept of the FST has received wide acceptance and attention in biology, medicine, psychology, education, cybernetics, philosophy and in a number of applied sciences and economics. The isomorphism of FS, i.e., identity of the basic principles underlying structural organization at various levels, has resulted in the development of physiological cybernetics as a new branch of science. On the basis of the FST, it has been possible to analyze the integrative activity of individual neurons; exhibits on chemical (vitamins, peptides, mediators) and physical (lasers) factors, as they affect neuronal function, were used to demonstrate the role of postsynaptic processes in the integration of signals converging on a single neuron. Laser studies were used to demonstrate the relationship between neurotransmitter-mediated postsynaptic excitation and intracellular neurochemical processes. A significant portion of the exhibits concentrated on the All-Union Program on "Systemic Mechanisms of Stability in the Face of Emotional Stress", which were based on the biological theory of emotions developed by P.K. Anokhin. These included information on the modeling of emotional stress in animals, which approximates socially-induced stress in man. The essential model in these studies consists of "conflict situations", which induce psychosomatic pathology. Systemic quantification of behavior was illustrated by studies on expert marksmen. As a result of optimization of their training, the time required for training was shortened and recovery of acceptable performance was accelerated. The computer program derived from such studies is applicable to

other sport activities. The exhibits also included demonstration of various instruments and equipment developed to facilitate such studies. Among the devices on exhibit were microelectronic radiotelemetry instruments, a device for measuring low-amplitude discharges from nerves, equipment for measuring angular acceleration in the joints of children, "Adaptron OFS-1" instrument for studying intuitive learning in man, and many other specialty items. Of more immediate and practical importance were a pace setter for breathing exercises, electric tactile stimulator for diagnosis of musculoskeletal disorders, a "Kovyl" apparatus for radio and telephone transmission of EKG patterns to diagnostic centers, and a systems approach to evaluation of biotechnical electrocardiostimulators. The exhibition also contained a demonstration of a computerized system for respiratory functional analysis which has been put into practical use in the health resorts of Crimea. The general consensus was that there is nothing more useful than a good theory. [1601-12172]

UDC 611.732.7-086:612.766.1

#### CHARACTERISTICS OF HUMAN MASSETER UNDER CONDITIONS OF HYPOKINESIA

Leningrad ARKHIV ANATOMII GISTOLOGII I EMBRIOLOGII in Russian No 9, Sep 84  
(manuscript received 23 Jun 83) pp 77-83

SOLOV'YEV, V.A., Department of Histology and Embryology (head of department Professor A.P. Gladkiy), Department of Dental Surgery (head of department Professor P.V. Naumov), Kalinin Medical Institute

[Abstract] Investigation of human masseters by quantitative methods with use of light microscopy and study under submicroscopic conditions involved study of 20 biopsies of the masseter of males, with normal bite, ranging in age from 21-30 years, 3, 6, 12, and 24 days after immobilization of jaw fractures. In 3 days after immobilization, intervals between some muscle bundles and fibers increased somewhat, indicating edema of the tissues while cisterns of the sarcoplasmic network expanded. The level of pinocytic vesicles in endothelial blood vessel capillaries increased. In 12 days after immobilization there appeared, in addition to unchanged fibers, fibers containing sections of decomposition and cytolysis. In 24 days after immobilization, the mean area of cross section of muscle fibers was reduced due to decrease of the percent of large myons, succinate dehydrogenase activity was much lower than that of the control figure, the percent of myons with low optical density increased while the percent with high succinate dehydrogenase activity decreased. Study of the dynamics of central moments of statistical distribution of succinate dehydrogenase activity after immobilization revealed the obvious enthalpic nature of changes of succinate dehydrogenase activity of the muscle tissue. The level of pinocytic vesicles in endotheliocytes of the capillaries changed and differed from control levels at all stages of the study. Figures 7; references 14: 10 Russian, 4 Western. [072-2791]



EFFECTS OF HYPERTHERMIA ON FREE AMINO ACIDS IN RAT BRAIN AND IN SUBCELLULAR FRACTIONS

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 6, Nov-Dec 84  
(manuscript received 23 Jan 84) pp 663-666

TURYANITSA, I.M., PASHCHENKO, A.Ye., DOROGIY, M.V. and FEDOROVICH, T.M.,  
Uzhgorod University

[Abstract] Effects of hyperthermia on free amino acid levels in the brain were studied in outbred rats to complement available data on the effects of hypothermia. The animals were exposed to elevated temperatures of  $45 \pm 1^\circ\text{C}$  for 7-60 min, sufficient to yield rectal temperatures of 39.6 to  $43.0^\circ\text{C}$  (vs. control value of  $37.4^\circ\text{C}$ ). Analysis of the grey matter revealed marked depression of most amino acids in the first 7 min of hyperthermia, with the exception of glutamic acid which rose to 104.5 mg% from a background value of 33.3 mg%. Thereafter, the levels of the various amino acids rose and in some cases exceeded control values. Analysis of mitochondria showed elevation of most acids during the initial 7 min, and thereafter depression to, or below, the control values by 20 min; a secondary rise was evident by 60 min. Analysis of the nuclear fraction of free amino acids revealed an opposite pattern to that observed with the mitochondria. These findings indicate that hyperthermia has a profound metabolic effect on the brain, and results in redistribution of the free amino acid pool among the subcellular fractions. References 13: 10 Russian, 3 Western.  
[1650-12172]

PSYCHOLOGICAL ASPECTS OF PHENOMENON OF SPATIAL SYNCHRONIZATION OF EEG POTENTIAL

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 71-83

LIVANOV, M. N. and SVIDERSKAYA, N. Ye.

[Abstract] For half a century attempts have been made to find an electrophysiological component in mental processes. One such approach uses maximum registration of electric wave processes in comparison with certain normal and pathological states, while another uses data of spatial and temporal bioelectric processes to support theories about isolabile nerve center factors and the synchronism of bioelectric activity in organizing brain functions. The forms, degrees and limits of such correlations, which remain problematical, are the subject of the present study. EEG records of 160 healthy and 55 ill subjects, the latter suffering psychopathy including paranoia and chronic schizophrenia, were made to determine the general level of synchronization, cross-correlational fields in individual sections of the cortex, and a coefficient of asymmetry in brain function. The complexity of spatial and temporal organization of bioelectric brain processes required isolation of

numerous parameters that had varying ties to psychological activity. The data indicated that the focus of maximum synchronization and specific types of personal behavior were functionally related. Feelings of self-worth had a positive correlation to EEG synchronization, and inter- and intra-hemispherical correlations were related to individual behavioral characteristics. Both basal and specific activity EEG patterns showed that spatial synchronization of biopotential can serve as an index of general activational shifts. The degree of intensity of non-specific general synchronization reflected the difficulty of intellectual tasks being performed, and a multi-channel EEG was the most effective methodological device for measuring this potential. Figures 4; references 28: 27 Russian, 1 Western.  
[097-12131]

UDC 612.82+612.822.3

#### TOPOGRAPHY OF HUMAN BRAIN ELECTRIC POTENTIALS AND DOMINANCE

Leningrad FIZIOLOGICHESKIY ZHURNAL in Russian No 10, Oct 84 (manuscript received 12 Mar 84) pp 1361-1365

DOROSHENKO, V.A., Laboratory of Physiology of Labor Processes (Acting Head V.A. Doroshenko), Physiological Institute imeni A.A. Ukhtomskiy, State University, Leningrad

[Abstract] A method of showing differences in topography of slow negative wave components recorded in associative regions of the cortex during uniform structure of activity of subjects as they performed different tasks involved 7 subjects of both sexes, ranging in age from 18-20 years. Subjects performed 2 sensomotor tasks involving reaction time and stimulus recognition with registration of the contingent negative variation. Differences in amplitude of early and late slow negative waves in lobal-central obductions were shown during performance of the tasks. Factoral analysis revealed latent mechanisms of development and changes of early and late negative waves during performance of the tasks. Figures 2; references 22: 10 Russian, 12 Western.  
[157-2791]

## FUNCTIONAL SIGNIFICANCE OF SOME EEG PARAMETERS AND DOMINANT PRINCIPLE

Leningrad FIZIOLOGICHESKIY ZHURNAL in Russian No 10, Oct 84 (manuscript received 12 Mar 84) pp 1366-1373

KANUNIKOV, I.Ye. and SHARIPOV, A.R., Department of Physiology of Man and Animals (Head A.D. Nozdrachev) Physiological Institute imeni A.A. Ukhtomskiy, Leningrad State University

[Abstract] Factual material obtained during study of contingent negative variation from A.A. Ukhtomskiy's position concerning dominance is analyzed and discussed. Subjects performed 4 different types of tasks involving intention, expectation, prediction and observation. EEG readings were taken from the frontal, temporal and central sections of the brain. Analysis of the material showed that contingent negative variation has a complete, uneven temporal-spatial organization and can be adequately described by 4 relatively independent components, differing in topography, time of development and sensitivity to variation of experimental variables being monitored. Problems concerning physiological mechanisms and functional significance of these factors from the point of view of the principle of dominance is discussed. Figures 2; references 21: 10 Russian, 11 Western.  
[157-2791]

## EFFECTS OF TASKS ON RESPONSES OF HUMAN SKIN MECHANORECEPTORS

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 104-110

SOININEN, K., YARVILEKHTO, T., ALEKSANDROV, Yu. I. and SHVYRKOV, V. B., Institute of Psychology, Helsinki University

[Abstract] It is generally accepted that activity in the efferent peripheral nervous system only reflects the physical properties of stimuli and does not depend on the behavioral situation or the task being performed. The present article reports on study of attempts to modify responses of skin receptors by various means of directing the attention of subjects. The 4 subjects were attached to gunsten electrodes and given 1-8 tests involving light and vibration, while reactions of nerve fibers were recorded. Meanwhile, the subjects were performing the tasks of either estimating the magnitude of the stimulus, or identifying exceptional sound stimuli in a group (the regular stimuli were at 300 Hz, the exceptional at 360 Hz). Results indicated that the tasks caused the responses of skin mechanoreceptors to vary, with the function of determining vibration magnitude resulting in lower thresholds, more responses and shorter latent periods. The central effects were related to direct somatic or sympathetic connections to the receptors or changes in mechanical properties of the skin. Thus, it was shown that mechanoreceptors do not simply transmit information on physical properties, but respond to central mood effects and external influences. Figures 4; references 16: 2 Russian, 14 Western.  
[097-12131]

EFFECTS OF HYPOTHERMIA ON BRAIN METABOLISM

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 15, No 4, Oct-Dec 84  
pp 85-99

EMIRBEKOV, E.Z., L'VOVA, S.P. and ABDULLAYEV, R.A., Neurochemical  
Problems Laboratory, Dagestan University, Makhachkala

[Abstract] A literature review is provided of the effects of hypothermia on the metabolism of the mammalian brain, in view of the importance of this topic both from the aspects of hypothermic surgery, as well as of accidental exposure. The basic conclusions that have been reached in such studies point to structural lability and biochemical disorders as the mechanisms by which cold damages the CNS. Hypothermia has the obvious effect of slowing microcirculatory blood flow and, therefore, compromises utilization of high-energy substrates which are necessary for ionic homeostasis and biosynthetic integration. In addition, and in a related manner, synaptic transmission undergoes functional deterioration as a result of membrane breakdown due to lipid peroxidation, uncoordinated function of enzyme systems, and alterations in the relative proportions of carbohydrate, phosphorus, and nitrogenous metabolites. These studies point to the possible use of various chemical intermediates in overcoming the adverse effects of hypothermia, as well as in fully utilizing the adaptive reserves of the brain in such situations. References 103: 8 Ukrainian, 64 Russian, 31 Western.  
[1601-12172]

EFFECT OF PROLONGED HUNGER DURING EXPERIMENTAL HIKES

Moscow SOVETSKAYA ROSSIYA in Russian 2 Oct 84 p 6

[Article entitled "20 Days Without Dinner"]  
RADZHABLI, V.

[Abstract] Study of reactions and physiological changes in persons taking long hikes or canoe trips while fasting was carried out to develop a model of behavior of tourist groups without food in an emergency in a remote area. The first stage of the experiment involved a 15-day trip of 537 kilometers by experienced hikers while 5 novices, including 2 women, participated in the second stage of the experiment. It was found that hunger itself does not decrease the capacity of persons to endure psychological and physiological stress but increases it. Personal interactions of members of the experimental group also helped to produce a positive physiological and psychological effect.  
[145-2971]

## PUBLIC HEALTH

### INDUSTRY-ASSOCIATED HEALTH RESORTS

Moscow TRUD in Russian 19 Aug 84 p 2

LYUBOYSKIY, P., chairman of the Smolensk Oblast Council of Trade Unions

[Abstract] The southern USSR has generally been regarded as a vacation spot and the setting for health resorts. But in order to avoid time lost for travel and adaptation to new climatic conditions, as well as vacation time, health resorts, more specifically preventive clinics designated for personnel working at large plants, closer to home have become popular. For example, in the Smolensk Oblast there are 12 such preventive clinics with total facilities for 1125 persons. One such clinic for a large aircraft enterprise is located close to the city in a picturesque setting on the shore of a lake; it has four buildings designated as sleeping quarters for 54 persons in each, a medical building, a recreational and dining facility and a building for balneotherapy. The medical facility consists of 18 examination rooms with up-to-date medical equipment, but it is not yet fully equipped. The network of preventive clinics is increasing in quantity and quality. Clinics have been built for a medical institute, the Smolensk nuclear power plant, an automobile plant and a pedagogical institute; even a mud-treatment center has been built for a flax-processing combine. A variety of treatments are also offered, from therapy with medicinal plants and acupuncture to relaxation training. A basic problem is that there are too few such clinics and that they are generally for employees of large industrial enterprises rather than individuals working in shops, on farms, and in institutions. The road to building such clinics is also not easy. For example, the Smolensk mill for producing knitted goods had an outdated clinic built in 1968. In March 1980, the Smolensk gorispolkom decided to demolish this clinic, but plans to build a new one are still not approved, despite efforts by the mill and trade unions. It is suggested that small organizations, including farm workers, cooperate in the construction and use of preventive clinics. In the case of farm workers, the obkom of the trade union, together with the oblast agricultural administration, can act as the official client, and these should work under the guidance of the oblast kolkhoz council. Preventive clinics can also be built in conjunction with an agricultural school, and thus provide workers with the opportunity to improve their education and health.

[122-9307]

EVALUATION OF BIOTRANSFORMATION CAPABILITY OF XENOBIOTICS IN CHEMICAL PRODUCTION WORKERS

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKIKH NAUK in Russian vyp 2, No 13, Aug 84 (manuscript received 23 Aug 83) pp 111-114

GICHEV, Yu. P., KESOVA, I. G., PROTASOV, V. V. and SALGANIK, R. I., Scientific Research Institute for Combined Problems of Hygiene and Occupational Diseases, Siberian Department, USSR Academy of Medical Sciences, Novosibirsk; Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] Recent decades have seen major development of urbanization and expansion of petrochemical and pharmaceutical industries, along with increasing use of chemicals in industry and agriculture. Great increases have come in the danger of poisoning. The present article reports on study of the biotransformation of xenobiotics in workers at a chemical pharmaceutical plant. The study was conducted on 54 healthy subjects, of which 20 were in direct production, 12 were occasionally in the production areas as a result of their administrative tasks and 22 (the control group) had no direct contact with the antipyrines of the test. The effects of acids, alkalis, alcohols, organic solvents, chlorinated and aliphatic hydrocarbons and pharmaceutical preparations were all assessed by extraction of solid particles from saliva and subsequent analysis. Clinical tests of the subjects showed arterial hypertension, stomach and intestinal disorders and bile disturbances, but they were found in all groups. Results showed that the simple method used was effective for early diagnosis of pathological processes among chemical workers and should be a regular prophylactic procedure. Figures 2; references 20: 13 Russian, 7 Western.

[082-12131]

SESSION OF PRELIMINARY COMMISSION ON PUBLIC HEALTH SERVICE AND SOCIAL INSURANCE

Moscow IZVESTIYA in Russian 19 Nov 84 p 2

[Article entitled "For Health of People"]

TURTORSKAYA, S., "IZVESTIYA" Special correspondent

[Abstract] Deputies and representatives of various ministries and departments attending the session of the preliminary commission on public health care and social insurance reported the constant improvement of health care for the Soviet peoples while pointing out some problems that require immediate attention. Improvement of polyclinic services was singled out as a primary task calling for extension and improvement of equipment and supplies to help solve this problem. Delays in hospital construction were discussed. The

need for more high-speed emergency vehicles and ambulances was emphasized. Further development of restorative therapy, medical rehabilitation and labor rehabilitation was called for. Delay in filling orders for health and antiseptic preparations and disinfectants was criticized. Development of computer tomography and other medical apparatus was recommended. A list of specific recommendations of the preparatory commission to industrial ministries and departments was presented.  
[165-2791]

UDC: 614.8-057(575.1)

# PREVENTING PRODUCTION INJURIES AT UZBEK METALLURGICAL PLANT IMENI V. I. LENIN

Tashkent MEDITSINSKAYA ZHURNAL UZBEKISTANA in Russian No 9, Sep 84 (manuscript received 7 Jan 83) pp 14-16

DUSMURATOV, M. D. and SHAKIROV, A. Sh., professors, KHASANOV, T. A., SHURMUKHAMEDOV, T. N. and ZAKIROV, M., candidates of technical sciences, Scientific Research Institute of Traumatology and Orthopedics, Uzbek SSR Ministry of Health

[Abstract] Studies of causes of production injury at the plant mentioned in the title were undertaken, including a careful analysis of reports on accidents filed between 1978 and 1981. Between 1978 and 1981 the frequency of injury decreased, but the severity of injuries increased. 42% of the traumas occurred as a result of failure to observe safety rules, 34% due to incorrect working procedures, 19% due to defective equipment or tools, 5% due to disruption of sanitary-hygiene norms. The welding and electric steel melting shop was the location of 64% of all injuries in this period. The distribution of injuries by occupation is presented. The administration of the enterprises and the technical safety service are primarily responsible for decreasing injuries. Shop chiefs, team leaders, foremen and medical personnel are the immediate organizers of measures designed to improve safety. Traumatologists are involved in recording of various types of injuries and analyzing them to determine the causes of injury and develop optimal measures, preventing future occurrences.

[1607-6508]

MOTOR VEHICLE INJURIES IN SAMARKAND OBLAST

Tashkent MEDITSINSKAYA ZHURNAL UZBEKISTANA in Russian No 9, Sep 84  
(manuscript received 1 Aug 83) pp 16-18

MURTAZAYEV, Kh. M., Department of Forensic Medicine, Samarkand Order of  
People's Friendship State Medical Institute imeni Academician I.P. Pavlov

[Abstract] A study of autopsy reports from the Samarkand forensic medical morgue which receives cadavers from the city of Samarkand, Dzhabay and Bulungur rayons of Samarkand oblast showed that motor vehicle accidents represent 19.8% of all causes of death. They are the leading cause of death due to injury. Persons 19 to 41 years of age represent 40.5% of all fatalities, children under 19--28.4%, persons over 61 years only 9.4%. 76.5% of persons who die in motor vehicle accidents are males. Most fatal motor vehicle injuries occur in the summer or fall during the period of massive harvesting and preparation of agricultural crops. The maximum number of injuries occur on Monday and Saturday. Some 56.4% of fatal accidents occur between 6:00 p.m. and midnight. 23.8% of accident victims had been drinking alcohol. References: 3 Russian.  
[1607-6508]

ESTONIAN HOSPITAL CONSTRUCTION

Tallinn MOLODEZH' ESTONII in Russian 10 Oct 84 p 1

AL'PEROVICH, E. and SHALYA, V.

[Abstract] A 400-bed hospital, now in the final stages of completion, is being built on the outskirts of Vil'yandi, a small, quiet city, by Andres Loygom. Loygom completed his studies at the Tallinn Polytechnic Institute 7 years ago, and in 1982 he became the chief engineer of the Vil'yandi mobile mechanized column (PMK), which is part of the rural construction board of the Ministry of Construction of the ESSR. His previous construction projects included an elementary school, a 200-bed hospital in Pylva and a hospital in Vyru. The new hospital is being built by many organizations. The Vil'yandi PMK is the major contractor with subcontractors from Payde, Rakvere, Pylva and Khaapsalu. Last summer the hospital was the site of a competition: republic reviews of occupational craftsmanship for plasterers, painters and tilers. Workers from the Vil'yandi PMK proved to be qualified specialists: the team of plasterers took first place, and other trades fared well. Tomas Yur'ye, a 5th class construction worker, Merike Vyaronen, a 4th class painter, and Rayov Otsa, secretary of the komsomol organization of the PMK, are cited. A photo of the hospital is presented.  
[051/A-9307]



## NEGLECT IN NURSERY HOMES

Moscow MEDITSINSKAYA GAZETA in Russian 31 Oct 84 p 3

ALEKSEYEV, Ya., inspector, RSFSR National Control Committee

[Abstract] A recent inspection tour in Volgograd and in other regions revealed serious deficiencies in the quality of medical care provided to single war veterans and other aged individuals. Medical rounds by specialists are not made with the frequency with which they are called for by various regulations, and in many cases the personal hygiene of the patients is neglected by the staff. This situation prevails despite laws formulated to avoid and prevent such neglect, and despite the vast sums accorded to the support of such institutions. The same institutions will be visited again in 1985 to make certain that the improvements instituted as a result of the visit of inspectors from the RSFSR National Control Committee are permanent, and that further steps are taken to assure the highest quality care that can be given to citizens that have done so much for the USSR in their lifetime.

[1580-12172]

## CURRENT PROBLEMS FACING HEALTH SERVICES IN TURKMENISTAN IN INDUSTRIAL AND AGRICULTURAL MEDICINE

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 4, Apr 84 pp 7-10

TESLER, D.B., first deputy minister, Turkmen SSR Ministry of Health, chief state sanitary physician, Turkmen SSR

[Abstract] In light of the decisions and resolutions of the 26th Party Congress, and subsequent Plenums and directives of the CC CPSU, work has been in progress to analyze the problems facing the health services in Turkmen SSR, and to plan for improvements in the 1985-1990 period. One of the major aspects of the problems deals with the health of industrial and agricultural workers. In view of this, major steps are being taken to further improve industrial and agricultural health services, and one of the manifestations of advances in this field will be the creation of an institute for occupational pathology in Turkmenistan. Other improvements anticipate the construction of new facilities and improvements in existing clinics and hospitals, as well as in further postgraduate training of the medical personnel. Obviously, the full scope of the intended change and improvements can only be realized if there is full cooperation among all the interested parties involved.

[092-12172]

## PSYCHOLOGY

### RUMORS AS SOCIAL PHENOMENON AND AS TOOL OF PSYCHOLOGICAL WARFARE

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 41-51

SHERKOVIN, Yu. A. and NAZARETYAN, A. P.

[Abstract] The authors cite the role of rumors in the early years of Soviet rule in resisting the new regime, including those predicting the end of the world or calamities of lesser proportions resulting from Soviet policies, e.g., toward religion. Then they analyze rumors according to audience and types, noting both informational and emotional aspects, geographic and temporal limits, and rumors of wishful, frightening and aggressive intent. Many of the examples cited relate to events in Africa and Latin America within the past 20 years, the rumors being largely attributed to US sources by the authors. The success of rumors requires that the intended audience be interested in the information transmitted, that there be a shortage of reliable information, and that the audience have confidence in the source of the rumor information. Aspects of social information, social psychology and psychology in general are regarded as involved in the phenomenon of rumors. Since they may have harmful effects on society, the authors suggest protective measures (such as plentiful reliable information) and active countermeasures to combat hostile rumors, which the authors attribute to bourgeois enemies of the USSR. At the same time, capitalist society in their view is less able to deal with rumors due to such factors as unemployment, class division and the impact of private capital on the media. References 10 (all Russian).  
[097-12131]

### PSYCHOLOGICAL PROBLEMS OF EVALUATING MANAGERIAL PERSONNEL

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 163-165

SVENTSITSKIY, A. L., doctor of psychological sciences

[Abstract] This review of a text by L. D. Kudryashova, Sistemno-psikhologicheskaya otsenka kadrov rukovoditeley i upravlencheskikh sistem, cites the author's statement that current methods of evaluating managerial effectiveness have shortcomings and then offers an assessment of her psychological systemic, comprehensive approach for determining overall

fitness for managerial positions. The reviewer finds her original testing approach, which differs from commonly-used questionnaires, to offer many advantages. A chapter on traditional managerial psychology which considers managerial "style" in both broad and narrow senses also receives a positive mark from the reviewer. The author's empirical typology of managerial categories, characterized as incomplete by the author, is nonetheless judged to be quite comprehensive. The last chapter gives a comparative analysis of managerial activities, with the principle conclusion that the common practice of replacing only the chief administrator where problems emerge is not sufficient to accomplish real improvements. The reviewer's chief reservations relate to expository style which, he feels, interferes at times with understanding. Brief mention is made of two other monographs on managerial personnel. All three are considered to offer practical guidelines, but sociopsychological aspects of managerial personnel require further scholarly attention.

[097-12131]

#### PSYCHOLOGY AND SCIENTIFIC AND TECHNICAL REVOLUTION

Moscow ZNAMYA in Russian No 11, Nov 84 pp 151-171

VASIN, M.

[Abstract] The successful experience of a young Moscow Power Engineering Institute graduate as he selected a group of specialists and created a master operator's station for Moscow Heat-and-Power Station No 21, which was converting to an automatic, computer-equipped regime, is told in narrative form. The account describes the success in carrying out this position of great responsibility in the absence of previous technical experience concerning such developments with emphasis on psychological aspects of the situation.

[148-2791]

UDC 616-001.28-07:[616.153.1:577.152.34.042.2+616.155.16

ACTIVITY OF BLOOD PLASMA  $\alpha_1$ -ANTITRYPSIN AND  $\alpha_2$ -MACROGLOBULIN IN RADIATION-THERMAL TRAUMA

Moscow PATOLOGICHESKAYA FIZIOLOGIYA I EKSPERIMENTAL'NAYA TERAPIYA in Russian  
No 5, Sep-Oct 84 (manuscript received 29 Mar 83) pp 17-20

KONNOVA, L.A. and NOVOSELOVA, G. S., Laboratory of Early Diagnosis of Radiation Injuries (director - Professor V.Ye. Komar), Central Scientific Research Roentgenoradiological Institute, USSR Ministry of Health, Leningrad

[Abstract] Study of the dynamics of changes of  $\alpha_1$ -antitrypsin activity and  $\alpha_2$ -macroglobulin activity in the proximate period after combined effect of radiation and thermal factors are described and discussed and the possibility of using these indicators in assessing severity of the pathological process after combined radiation and burn injuries was considered. Experiments were performed on white male mongrel rats weighing 180-200 g with  $^{60}\text{Co}$  [sic] gamma-irradiation dose of 0.6 Gr/min; size of field 20X20 cm; distance of source from skin 75 cm ( $\text{LD}_{50/30}$ ) and third degree burns over 15 percent of the body. Burn trauma increased  $\alpha_1$ -antitrypsin activity on the 2d-3d day after injury while  $\alpha_2$ -macroglobulin activity remained practically normal. In 24 hours after irradiation,  $\alpha_2$ -macroglobulin activity decreased by 42 percent in comparison with initial level and stayed at this level throughout the experiment.  $\alpha_1$ -Antitrypsin exceeded control level only at 72 hours after irradiation. After combined radiation-thermal trauma, the  $\alpha_2$ -macroglobulin level was 57 percent below the norm and remained low for 3 days while  $\alpha_1$ -antitrypsin activity, after combined radiation-thermal injury, was unchanged throughout the tests. These data may be used as a supplementary test of radiation injury. References 11: 8 Russian, 3 Western.  
[081-2791]

## EFFECTS OF ACUTE RADIATION SICKNESS ON MICROSOMAL CHOLINE PHOSPHOLIPID METABOLISM IN RAT BRAIN

Kiev UKRAINSKIY BIOKHMICHESKIY ZHURNAL in Russian Vol 56, No 6, Nov-Dec 84 (manuscript received 6 Jul 84) pp 671-674

GRINCHUK, D. V., VASIL'YEV, A.N. and KUCHERENKO, N.Ye., Kiev University imeni T.G. Shevchenko

[Abstract] Outbred rats with x-ray induced acute radiation sickness were employed in studies on the effects of such pathology on phospholipid metabolism in the microsomal fraction of the grey matter. The studies involved measurement of the incorporation of radiolabeled choline and cytidine diphosphate-choline (CDC) into the sphingomyelin and phosphatidylcholine fractions. Within 1 h of irradiation, marked differences were evident in the rates of incorporation of the label: the radioactivity of phosphatidylcholine isolated from membranes incubated with CDC increased more than four-fold, while incubation with choline resulted in a two-fold decrease in incorporation. In conjunction with the fact that incorporation of the label into sphingomyelin from CDC is also enhanced in acute radiation sickness, it appears that such pathology potentiates the cytidine pathway of phospholipid biosynthesis. References 13: 4 Russian, 9 Western. [1650-12172]

## CHANGE IN INTRINSIC ULTRAVIOLET FLUORESCENCE OF HELA CELLS EXPOSED TO IONIZING RADIATION

Leningrad TSITOLOGIYA in Russian Vol 26, No 9, Sep 84 (manuscript received 29 Jul 83) pp 1048-1053

KALENDO, G. S., SAVINOV, A. G., DEMIDOVA, N. I. and SEREBRYAKOV, N. G., All-Union Scientific Oncological Center, USSR Academy of Medical Sciences, Moscow

[Abstract] The effect of low doses of ionizing radiation, capable of stimulating proliferation (10 rad) and intrinsic UV fluorescence (UVF) of HeLa cells was studied along with doses leading to inhibition of mitotic activity and to maximum increase of UVF of such cells. The experiments were done on resting cells. Immediately after irradiation there were no changes observed in UVF intensity; however, they appeared at about the third postirradiation day when the cell began the proliferating process. The deviations from the control values were opposite: at 10 rads the UVF intensity of HeLa cells decreased, while at 500 rads it became intensified. It was concluded that the changes in UVF of HeLa cells were not related to any changes in the synthesis of rapidly tagging <sup>3</sup>H-tryptophan containing proteins

since the radioactivity in control and in experimental samples recalculated per  $10^3$  cells was identical. Figures 5; references 18 (Russian).  
[075-7813]

UDC 615.849.2.015.25:547.458

#### RADIOPROTECTIVE EFFECTS OF DEXTRAN SULFATE

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
(manuscript received 19 Aug 83) pp 90-93

ZHUKOVA, N.A., PALYGA, G.F., MAKSIMENKO, A.A., FILIPPOVA, S.A., VATSEK, A. and ROTKOVSKA, D., Department of Radiation Pathophysiology, Institute of Medical Radiology, USSR Academy of Medical Sciences, Obninsk; Laboratory of Mammalian Radiosensitivity, Institute of Biophysics, Czechoslovak Academy of Sciences, Brno, Czechoslovakia

[Abstract] The radioprotective effectiveness of 500,000 MW dextran sulfate was assessed on (CBA x C57Bl) $F_1$  mice exposed to  $^{60}\text{Co}$  gamma irradiation in doses of 9, 9.57 or 15.86 Gy. <sup>1</sup>One to three days prior to irradiation the mice were treated intraperitoneally with 0.2 ml (60 mg/ml) of the dextran solution. Pretreatment was found to increase the 30 day survival rate by 45-70%. Administration of the dextran one day before irradiation enhanced postradiation recovery of leukocyte counts, repletion of the bone marrow with nucleated cells, and splenic weight gain. Administration of the dextran three days before irradiation had no telling effect on postradiation leukopenia or bone marrow cytopenia. These observations indicate that time is a critical factor in the radioprotective effectiveness of dextran sulfate, and that the rate of survival is not directly linked to cellular recovery. Figures 1; references 12: 9 Russian, 4 Western.  
[1638-12172]

## VETERINARY MEDICINE

### ZONAL SCIENTIFIC AND PRODUCTION CONFERENCE IN CHELYABINSK

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 78-80

FEDOTOV, V. G.

[Abstract] This zonal conference dealt with "Use of Medications in Treating and Preventing Disease and Poisoning of Animals at Production Complexes and Farms as a Factor in Improving Productivity". It was attended by scholars and practical veterinarians from Chelyabinsk, Kurgansk, Sverdlovsk and Orenburg oblasts and the Bashkir ASSR. Academician I. Ye. Mozgov of the All-Union Agricultural Institute imeni V. I. Lenin stressed the importance of sound prescription of medications. Food additives and their importance were also emphasized. Spot checking of producing milk cows for chemical balance, etc., was recommended for gynecological and milk production reasons. Use of both herbal and antibiotic medications was covered by various participants. Sulfanilamides, especially those with long-term effectiveness, nitrofurans, and anthelmintics were discussed in terms of indications and dosages. Problems of barrenness, digestive and intestinal ailments in new-born calves, pollution of waters and pastures, especially by nitrates, and related problems were among the topics presented. The psychological effects of transportation, herd changes and removal of calves from their mothers were presented by V. S. Buelama of the All-Union Institute of Non-Infectious Diseases. Practical problems in analyzing diseases and planned treatment procedures were also discussed.  
[086-12131]

UDC 619:576.807.9:576.852.2:636.22/.28

### QUICK-GROWING ATYPICAL MYCOBACTERIA AND THEIR SIGNIFICANCE FOR CATTLE PATHOLOGY

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 29-30

SHUVERSKIY, V. Ye., OVDIYENKO, N. P., KADOCHKIN, A. M. and KUDYAKOV, V. N.,  
All-Union Institute of Experimental Veterinary Medicine

[Abstract] Atypical mycobacteria have been attracting interest since the 1960s, since in their presence no tubercular changes have been observed in

slaughtered cattle. Quick-growing mycobacteria are found throughout the environment in soils, water, turf and feeds. The present article reports on study of sensitizing and pathogenic properties of *M. phlei*, *M. diernhoferi*, *M. flavescens* and *M. fortuitum* taken from cattle who reacted to tuberculin. The mycobacteria were then studied after administration to 4-month-old calves. Appetites, overall attitude and temperatures were observed in the calves to determine their allergic reactions in 30, 60, 90 and 120 days. Results showed that within 90 days all calves receiving the mycobacteria had allergic reactions. After 180 days, the calves were slaughtered; analysis showed no histological changes. The mycobacteria were judged to cause sensitization but no pathological changes.  
[086-12131]

UDC 619:576.809.72:576.852.21:636.22/.28

#### STUDY OF IMMUNOGENIC PROPERTIES OF ATYPICAL MYCOBACTERIA OF AVIUM INTRA-CELLULARE COMPLEX

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 32-33

SVIRIDOV, V. D., Odessa Scientific Research Veterinary Station

[Abstract] Atypical mycobacteria of the avium-intercellulare complex are known to sensitize cattle, but their role in the epizootology of tuberculosis has received little attention. Observations have shown that where livestock is exposed to atypical mycobacteria, reaction to tuberculin is temporary and ceases after 6-9 months, whereas normally it lasts for years. The present article reports on study of the immunogenic properties of strains of atypical mycobacteria isolated from cattle in comparison to BCG vaccine. Cultures *M. avium* No 708 and *M. intracellulare* No 715 were obtained from cattle and administered to guinea pigs, then the dynamics of mycobacteriemia and accumulation of agglutinates were monitored after 1 hour, 1 day, and then weekly for a month. Results showed that the sensitization of cattle to tuberculin brought on by the tested mycobacteria, which displayed immunogenic properties, should be studied further to create lasting immunity to tuberculosis in cattle.  
[086-12131]

#### CHANGES IN INTERNATIONAL CLASSIFICATION OF INFECTIOUS ANIMAL DISEASES

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 36-37

BAKULOV, I. A.

[Abstract] The article summarizes changes in the International Classification of Infectious Animal Diseases made by the general session of the International Epizootic Bureau. The earlier classification of three



categories has been changed to one of two groups, the first consisting of rapidly spreading diseases such as foot and mouth disease, cattle plague and 14 other epidemic diseases. The second category includes subdivisions for diseases affecting various genera (anthrax, rabies, etc.), and diseases of cattle, sheep and goats, horses, swine, poultry, rodents, fish and bees. The diseases in group B are considered to be regional. The new classification does not take diseases common to humans and animals into account, and does not consider rabies or glanders as ubiquitous. Although the author sees these shortcomings of the new list, nonetheless he regards it as a step forward and an impetus for developing a more suitable classification.

[086-12131]

UDC 619:576.807.9:576.852.2

#### DIFFERENTIATION AND IDENTIFICATION OF MYCOBACTERIA

Moscow VETERINARIYA in Russian No 9, Aug 84 pp 62-63

KADOCHKIN, A. M., All-Union Institute of Experimental Veterinary Medicine

[Abstract] This article reports study of potentially pathogenic mycobacteria for humans, including *M. kansasii*, *M. marinum*, *M. scrofulaceum*, *M. intracellulare*, *M. avium*, *M. xenopi*, *M. ulcerans*, *M. fortuitum* and *M. chelonae*. To achieve differentiation and identification of these mycobacteria, the author examined 111 cultures, of which 33 came from lymphatic vessels of tubercular cattle, 25 from swine, 3 from sheep and 50 from environmental sources (pastures, water and feed, etc.). Bacterioscopy, temperature and growth period, pigmentation and other factors were studied. Control was composed of 16 standardized strains of mycobacteria. Results indicated that dimensions and coloration were not distinctive features. Other culture, morphological and biochemical methods were effective in distinguishing mycobacteria strains and determining which were likely to be associated with tuberculosis, such as *avium-intracellulare* complexes, nonphotochromogenic mycobacteria found in livestock, and rapidly growing environmental *nonchromogenecum-terrae-triviale* complexes, found in pastures and other locations where livestock are kept.

[086-12131]

## DIAGNOSIS OF SWINE DYSENTERY BY FLUORESCENT ANTIBODY METHOD

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 64-66

GOLIKOV, A. V., ZENIN, G. V., BONDIK, V. V. and BUKHANOV, V. D., Belgorod Branch, All-Union Order of Lenin Institute of Experimental Veterinary Medicine

[Abstract] Since the discovery of the pathogen *Treponema hyodysenteriae* as the cause of swine dysentery, diagnosis has turned to seeking ready identification of that microorganism. The present article reports on an immunofluorescent method using serum from hyperimmunized rabbits, from which corpuscular antigens were obtained by a procedure which is described. Three groups of chinchilla rabbits were immunized, by a modified Hunter-Clark method, a method described by A. Yu. Samostrel'skiy, and one described by Baum and Jones. Then, antigen characteristics were determined by agglutination and immunofluorescent methods. Five strains of *T. hyodysenteriae* studied were found to be serologically identical. The luminescent serum was then tested by using materials from four dysentery-free pig farms in comparison to fecal materials from swine with dysentery. Procedures and standards are discussed. Results showed that the fluorescent antibody method was superior to bacteriological methods in discovering and identifying the dysentery pathogen in pathological material, and also provided a reliable indication of the pathogen in the environment. [086-12131]

## TASKS OF CLINICAL VETERINARY PHARMACOLOGY

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 67-69

YEVDOKIMOV, P. D., Leningrad Veterinary Institute

[Abstract] This is a report on the current state and planned directions of clinical veterinary pharmacology as it attempts to study the effects of medicines on healthy and diseased animals, including processes of administration, distribution in the body, biotransformation and excretion. The means of injection and absorption, attachment to plasma protein or free circulation, and distribution to individual organs are discussed. Blood supply, tissue barriers of organs and overall metabolism were found to be key determinants, and the role of the liver in altering and utilizing medications was recognized as a major factor. This information is essential in order to determine therapeutic effects and side effects of medications, which often occur because of excessive doses. Highly-active antibiotics and antimicrobial substances cause changes in pathogenic and saprophytic microbes that often are essential to health in animals, and these factors must also be taken into account in selecting medications. Further study is required of vitamins and coenzymatic preparations used for a wide range of ailments. Neurolytic

preparations, tranquilizers, heart medicines, diuretics, laxatives and other digestive tract medications, as well as various medications which enhance milk production or fattening of livestock, are listed among the elements of clinical veterinary pharmacology requiring advancements in coming years.

[086-12131]

#### SIMULATED SITUATION EXERCISES FOR VETERINARY SANITATION STUDIES

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 69-70

BARABASH, A. F. and REZNIK, N. K., Odessa Agricultural Institute

[Abstract] This is a report on the use of simulated situation exercises as a means of active practical application of theoretical instruction in the Department of Zoohygiene and Veterinary Sanitation. Specifically, a model for increasing hygiene in milk production involving 6 hours of classroom preparation and 4 hours of independent work is followed. Students act out roles of veterinarians, epizootologists, bacteriologists, laboratory directors and milk producer veterinarians in which they work through situations that encompass milk quantity and quality and living conditions for the cows. A typical situation might involve the repair of the pasteurizing equipment and use of milk during the break-down. The exercises underline the need for comprehensive approaches to these and analogous situations involving veterinary science.

[086-12131]

#### REPORT OF USSR MINISTRY OF AGRICULTURE

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 76-77

LOMOVA, Ye.A.

[Abstract] This report present new guidelines for using new pharmaceutical preparations in treating young farm animals, chiefly calves, for ailments of the digestive tract. Preparations discussed include medicinal lignin for controlling harmful microorganisms, "Pagmin" for normalizing protein metabolism and increasing gamma globulin in the blood, "Gemodez" for improving osmotic pressure and diuresis, cortisone acetate to prevent or treat digestive problems, Bergeenia root powder for non-infectious stomach ailments in adult livestock and poultry, "Spelakt" for normalizing mineral metabolism and suppressing dehydration, "Laktolizat" for similar use, "Lers" for preventing casein bezoar and chlorine ion deficiency, pancreatin for better hydrolysis of fat, protein and nucleic acid, and "Silabolin" to hasten protein synthesis.

[086-12131]

OBLAST SCIENTIFIC AND PRACTICAL VETERINARY CONFERENCE IN SIMFEROPOL

Moscow VETERINARIYA in Russian No 9, Sep 84 pp 77-78

KORDONSKIY, Ye. I.

[Abstract] The oblast conference (for which no date is given) included reports on the high achievements of animal husbandry in the Crimea in both production and sales of animal products, objectives for the coming period in improving the veterinary science state of the region, the work of the oblast veterinary science laboratory in improving diagnosis, modern methods of preventive medicine and treatment, new methods in dealing with insects and other pests in animal dwellings, and mechanized methodology in veterinary practice. A mobile exhibit was presented which covered themes of calf care and treatment, care of milk-producing herds, and disinfection theory and practices.

[086-12131]

EFFECTS OF COXIELLA BURNETII ON HEXOSE MONOPHOSPHATE SHUNT STIMULATION  
AND SUPEROXIDE ANION PRODUCTION IN HUMAN POLYMORPHONUCLEAR LEUKOCYTES

Bratislava ACTA VIROLOGICA in Russian Vol 28, No 3, May 84 (manuscript  
received 31 Aug 83) pp 246-250

FERENCIK, M., SCHRAMEK\* S., KAZAR\*, J. and STEFANOVIC, J., Institute of  
Microbiology and Immunology, Medical Faculty, Komensky University, Bratislava;  
\*Institute of Virology, Slovak Academy of Sciences, Bratislava, Czechoslovakia

[Abstract] Studies on the intracellular fate of *Coxiella burnetii* were conducted with human polymorphs and killed *C. burnetii*, based on the analysis of the metabolic effects of the parasite. Killed phase II cells, but no phase I cells, induced moderate enhancement of the hexose monophosphate shunt (HMS) and superoxide anion (SA) production. Preincubation of both phases with donor serum (free of antibodies) had no effect on the outcome. However, both activation of HMS and SA production were increased by opsonization with immune rabbit serum containing antibodies against phase I and/or phase II cells. Leukocytic HMS activity and SA production was also enhanced by exposure to a lipopolysaccharide-protein-phospholipid complex isolated from phase I cells, but not with the lipopolysaccharide-protein or the lipopolysaccharide components. Activation of leukocytic metabolism is presumably an aspect of the killing mechanism related to phagocytosis. Further studies will have to be conducted with macrophages to determine the extent to which this prevails in cells primarily responsible for *C. burnetii* elimination. References 24: 8 Russian, 4 Slovak, 12 Western.  
[1633-12172]

## INFORMATION MODEL OF MECHANISM OF RETROVIRAL ONCOGENESIS

Novosibirsk IZVESTIYA SIBIRSKOGO OTDELENIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKIKH NAUK in Russian vyp 2, No 13, Aug 84 (manuscript received 24 Oct 83) pp 108-111

TSIDULKO, A. Kh., (deceased) Institute of Cytology and Genetics, Siberian Department, USSR Academy of Sciences, Novosibirsk

[Abstract] The mechanisms of formation of malignant tumors have recently been shown to be based in pathological activation of an information system already present in healthy cells. A combination of tumor and normal cell properties occurs that varies for each type of tumor. Autonomy, particularly from surface contacts, and similarity to embryonic processes is emphasized. The transition from normal to malignant growth is discussed in terms of initiation of the process, its course and its hardness, or resistance to attempts to control it. The emergence of autonomous proliferation control, development of similarities to embryonic cells, sudden emergence of depressions permitting activation of information and extended lag in realization of such genetic information, evolutionary hardness and distribution of the control mechanism throughout the cytoplasm, are topics of the discussion. The realization of initial information, especially in reverse transcription of mRNA, is an important function in the development of malignant neoplasms. More study to create monoclonal immunological antigens and test them is recommended. References 29: 14 Russian, 15 Western. [083-12131]

UDC 615.371:578.832.1].074:544.543

## SAFETY AND EFFECTIVENESS OF AEROSOL ADMINISTRATION OF CHROMATOGRAPHIC INFLUENZA VACCINE IN ANIMALS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 16 Nov 83) pp 527-530

BICHURINA, M.A., BRYANTSEVA, Ye.A., ROZAYEVA, N.R., TITOVA, T. S., KOROVINA, G.I., SHEVCHENKO, A.I., FRIDMAN, E.A. and NOSKOV, F. S., Institute of Epidemiology and Microbiology imeni Pasteur, Leningrad

[Abstract] Experimental trials were conducted on the safety and efficacy of the Soviet chromatographic vaccine prepared from influenza virus A/Leningrad/399/76 (H3N2), when administered as an aerosol to animals. Studies on guinea pigs indicated that aerosol administration was much less likely to sensitize and induce an anaphylactic reaction than intramuscular administration. Immunization of albino rats by the respiratory and intraperitoneal routes showed that the former route elicited a much weaker serum antibody response than the latter route (antibody titers 1:60 vs. 1:862, respectively).

However, the secretory antibody levels were on the same order of magnitude with both routes, even though the aerosol dose was 10- to 20-fold lower than the parenteral dose. Albino mice protection studies indicated that the aerosol route was effective with two or three applications in mice primed with the vaccine intraperitoneally. These experimental observations indicate that the 'chromatographic' [chromatographically purified ?] vaccine has the potential of being useful when administered via the respiratory route as an aerosol, and, that clinical trials with humans should be considered. References 7: 3 Russian, 4 Western.  
[1586-12172]

UDC 616.98:578.833.26]-07

#### ISOLATION OF SYR-DARYA VALLEY FEVER VIRUS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 1 Feb 84) pp 553-558

L'VOV, D.K., KARIMOV, S.K., KIRYUSHCHENKO, T.V., CHUN-SYUN, F., SKVORTSOVA, T.M., TERSKIKH, I.I., GOFMAN, Yu.P., BEREZINA, L.K., GROMASHEVSKIY, V.L., KONDRASHINA, N.G. and KLIMENKO, S.M., Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow; Scientific Research Institute of Epidemiology, Microbiology and Infectious Diseases, Kazakh SSR Ministry of Health, Alma-Ata

[Abstract] Standard virologic and epidemiologic studies were conducted on 109 patients with a febrile illness of the Syr-Darya Valley, as well as on ixodide ticks collected in that region. The case study of one patient is presented with general symptomatology indicative of arbovirus infection. An etiologic viral agent was isolated from the blood of the patient and from ixodide ticks (*Dermacentor daghestanicus* and *Hyalomma asiaticum*), and shown to be antigenically related to the Sikhote-Alyn virus. The new virus was further identified and classed in the Picornaviridae family, in the Cardiovirus genus. On the basis of the region of isolation, it has been designated the Syr-Darya Valley Fever Virus. Figures 6; references 5: 1 Czechoslovak (in English), 4 Western.  
[1586-12172]

VIRUSES IN STOOL SPECIMENS OF PATIENTS WITH HEPATITIS AND OTHER ENTERO-VIRAL INFECTIONS

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 2 Dec 83) pp 559-566

ANDZHAPARIDZE, A.G., BALAYAN, M.S., SAVINSKAYA, S.S., MAKHMEDOV, M.K., ANNENKOV, A.Ye. and GORYUNOVA, N.A., Institute of Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow

[Abstract] A summary is presented of the results of direct and immune electron microscopy of 842 stool specimens obtained from 461 patients with hepatitis and other enteroviral infections. The highest incidence of positive hepatitis A virus (HAV) identification was seen in patients with water-borne (40.9%) and food-borne (36.9%) outbreaks. On a general basis, during peak seasons of hepatitis A, positive identification was made in 11.8% of the patients, and, during off-season, in 5% of the subjects. In a small number of hepatitis A cases adenoviruses and other enteroviruses were also identified, in addition to HAV. Patients presenting with a diagnosis of hepatitis B generally had adenoviruses and various enteroviruses in their stool specimens. Additionally, patients, not diagnosed for hepatitis during peak hepatitis seasons, were found to be positive for HAV, as well as adenoviruses, various enteroviruses, astrovirus, coronavirus and roavirus. Patients with typical HAV particles also presented with empty HAV particles, and 17-27 nm structures poorly reacting with antibody. Figures 11; references 30: 9 Russian, 21 Western.  
[1586-12172]

UDC 616.98:578.833.29]-078.73

RAPID DIAGNOSIS OF CRIMEAN HEMORRHAGIC FEVER BY PASSIVE HEMAGGLUTINATION WITH ANTIBODY-COATED ERYTHROCYTES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 5 Dec 83) pp 566-569

KLISENKO, G.A., GAYDAMOVICH, S.Ya., ZARUBINSKIY, V.Ya., LAPINA, T.F. and MELIYEV, A.M., Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow

[Abstract] A passive hemagglutination test with antibody-coated erythrocytes was employed for rapid diagnosis of Crimean hemorrhagic fever in 12 suspected cases. The tests yielded positive results if the serum samples were obtained before the 10th day of the infection, with the procedures themselves requiring only 2-3 h for completion. Application of the test to cadaveric materials (blood, organ suspensions) also resulted in identification of the specific viral antigens, and might be used in such cases when



tests involving suckling mice are inapplicable because of specimen toxicity.  
References 8: 2 Czechoslovak (in English), 5 Russian, 1 Western.  
[1586-12172]

UDC 578.833.24.04:615.332

#### EFFECTS OF ACTINOMYCIN D ON MACHUPO VIRUS REPRODUCTION

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 5 Dec 83) pp 569-572

LUKASHEVICH, I.S., LEMESKO, N.N. and SHKOLINA, T.V., Scientific Research Institute of Epidemiology and Microbiology, Belorussian SSR Ministry of Health, Minsk

[Abstract] Previously-described tissue culture methodology was employed in assessing the effects of actinomycin D on Machupo virus reproduction [Carter, MF, et al., J. Virol., 12: 33-38, 1973; Casals, J., Yale J. Biol. Med., 48: 115-140, 1975; Leung, WC, Internatl. Cong. Virol., 4th., Procs., Wageningen, v. 4:33-38, 1978]. The resultant data were analyzed in conjunction with the effects of alpha-amanitin, mitomycin C and ethidium bromide. In summary, addition of actinomycin D at late stages of the reproductive cycle decreased the harvest of infectious Machupo particles in an exponential manner by 2 log units. Concomitantly, synthesis of virus-specific proteins was not inhibited more than three- or four-fold. Similar results were obtained with alpha-amanitin, while mitomycin C and ethidium bromide failed to inhibit viral reproduction. The data were interpreted to indicate that actinomycin D affects only the late stages of Machupo virus reproduction, and that its mechanism of action involves some cellular factor or factors required for the late stages of reproduction. Figures 1; references 12: 5 Russian, 7 Western.  
[1586-12172]

UDC 578.245.2:578.223

#### DOUBLE-STRANDED RNA AS INTERFERON INDUCER

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 (manuscript received 14 Nov 83) pp 599-603

NOSIK, N.N. and YERSHOV, F.I., Institute of Virology imeni D.I. Ivanovskiy, USSR Academy of Sciences, Moscow

[Abstract] The stability and biological activity of double-stranded RNA (dsRNA) was isolated from amber mutant of E. coli phage  $f_2$  to further define its potential usefulness as an interferon inducer. After 4 months of storage at 4°C in solution (1 mg/ml) the activity fell from 640 IU/ml to

80 IU/ml, while at room temperature all activity was lost after 2 weeks. Lyophilized preparations retained full interferon-inducing activity for the 2.5 year period of observation. Preparation of aerosol inocula showed that ultrasonication had no negative effect on the dsRNA. LD<sub>50</sub> for outbred albino mice ranged from 20-50 mg/kg for the different preparations, and were nonpyrogenic in studies on chinchilla rabbits. Administration of dsRNA to mice by various routes resulted in interferon production in 3-5 h, with the onset and levels depending on the route and dose. Antiviral effectiveness of the dsRNA preparations was demonstrated in mice studies against tick-borne encephalitis and influenza viruses after a single prophylactic administration. These preliminary studies indicate that dsRNA may be a promising agent in the prevention and, perhaps, management of viral infections; therapeutic trials are currently under way. Figures 3; references 15: 1 Czech, 10 Russian, 4 Western.  
[1586-12172]

## CONFERENCES

UDC 615.9:061.22.055.1(470.23-25)"1983"

### REPORTS ON PROCEEDINGS OF LENINGRAD SCIENTIFIC SOCIETY OF TOXICOLOGISTS IN 1983

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
pp 112-114

CHEKUNOVA, M.P. and LUKOVNIKOVA, L.V.

[Abstract] The membership of the Leningrad Scientific Society of Toxicologists stood at 192 in December 1983. In 1983, 7 Society meetings were held at which 9 papers were discussed. At the 8th meeting held on Feb 18, 1983 S.A. Kutsenko (Military Medical Academy [MMA] imeni S.M. Kirov) presented a talk on the "Effects of Anticholinesterase Agents on Catecholaminergic Systems in the Brain", which involved fluorescent microscopic examinations of rat brains. Kutsenko reported that within 30 min of administration of an organophosphorus compound (0.6-0.7 LD<sub>50</sub> dose) there was a 1.2- to 1.5-fold increase in catecholamine fluorescence in most brain structures. After 5 days, fluorescence returned to background levels, but 4 h after administration the intensity of fluorescence corresponded to 60-80% of the control value. Administration of the agent in a dose equivalent to 0.9 LD<sub>50</sub> led to depression of fluorescence without the intermediate phase of enhanced catecholamine fluorescence. The affected cerebral structures also showed marked reduction in cAMP levels. The results demonstrated that acute organophosphorus toxicity affects the catecholaminergic systems in the brain. At the 11th meeting, held on 25 Oct 1983, Yu.Yu. Bonitenko and V.K. Belikova (MMA) reported on "Lipid Peritoneal Dialysis in Poisoning with Lipotropic Poisons". Experiments on albino rats were used to study the ingress of various lipotropic toxins into dialysis fluids during peritoneal dialysis after subcutaneous administration of chlorinated and aromatic hydrocarbons, intragastric introduction of 1,2-dichloroethane or CCl<sub>4</sub>, and the histopathology of various internal organs. Peritoneal dialysis was found to remove significantly more of the toxins than can be removed by classical methods, and the survival figures of the animals are correspondingly improved. The authors also discussed possible complications of lipid peritoneal dialysis and the perspectives for clinical application of this technique. At the 12th meeting, held on December 1, 1983, which was dedicated to the memory of N.V. Lazarev, V.A. Filov discussed Lazarev's manual entitled "Noxious Agents in Industry". The manual covers the history of industrial toxicology and probable future

perspectives, and was based on many years of experience. The manual was published in 7 editions and translated into a number of foreign languages. It has been proposed that this manual serve as a basis for the publication of a multivolume handbook on "Noxious Agents in the Environment". Members of the society have presented a total of 237 talks at Soviet and international scientific meetings in 1983, and have produced a total of 135 scientific articles and books. In addition to basic research, members of the Society are also involved in educational endeavors and function as consultants in toxicology at various public health establishments.  
[1638-12172]

UDC 615:061.22.055.1(470.23-25)"1983"

#### REPORT ON PROCEEDINGS OF LENINGRAD PHARMACOLOGICAL SOCIETY IN 1983

Moscow FARMAKOLOGIYA I TOKSIKOLOGIYA in Russian Vol 47, No 6, Nov-Dec 84  
pp 110-112

DENISENKO, P.P., professor, chairman, Leningrad Pharmacological Society, and  
LAPKINA, G.Ya., candidate of medical sciences, secretary, Leningrad  
Pharmacological Society

[Abstract] In 1983 the Leningrad Pharmacological Society held 9 scientific meetings, at which 21 scientific papers were presented. At the 170th meeting held on March 18, 1983, A.V. Smirnova (Military Medical Academy [MMA] imeni S.M. Kirov) reported on "New Approaches in the Search for Agents Improving Physical Performance". A number of new derivatives of benzimidazole, guanylylthiourea, etc., have been shown to be particularly effective in this respect, and also facilitate recovery of performance after exertion. Their effects are metabolic, with enhancement of gluconeogenesis playing a key role. In addition, exogenous RNA techniques have been developed to study the mechanism of action of agents whose effectiveness is related to activation of protein synthesis in various organs. At the same meeting S.F. Frolova (MMA) presented a paper on "Pedagogical Aspects of Training at the Chair of Pharmacology at the MMA imeni S.M. Kirov". At the 171st meeting, held on April 12, 1983, Ye.B. Shustov (MMA) presented a talk on the "psychophysiological Aspects of Pharmacologically-Mediated Performance Improvement in Operators under Hypoxic Conditions". Members of the Society maintain active contacts with researchers abroad and participate in international scientific symposia. In addition, the Society itself maintains close contact with pharmacological societies in Poland, Hungary and other countries.  
[1638-12172]

DISCUSSION ON ORIGIN OF PANDEMIC STRAINS OF INFLUENZA VIRUSES

Moscow VOPROSY VIRUSOLOGII in Russian Vol 29, No 5, Sep-Oct 84 pp 629-634

AKHUNDOVA, E.D., candidate of biological sciences, Moscow

[Abstract] The Scientific Council on Virology of the USSR Academy of Medical Sciences and the Learned Council of the Institute of Virology imeni D.I. Ivanovskiy of that Academy organized a routine plenary discussion session on the origins of pandemic strains of the influenza virus. The group met in Moscow, and the discussion was opened by Corresponding Member of the Academy of Medical Sciences D.K. L'vov (Moscow), who also delivered the main lecture. L'vov and the other participants presented views covering the two basic theories currently advanced by their advocates to explain the origins of pandemic strains, namely genetic reconstitution of the infectious viruses and reemergence from a reservoir. The meeting was adjourned with concluding remarks by Academician (AMS) V.M. Zhdanov, who underlined the importance of such discussions and the airing of contradictory views. The problem is of such importance that it will require much more research and considerably more discussion before a generally accepted agreement can be reached.

[1586-12172]

INTERNATIONAL SYMPOSIUM ON PSYCHOPHYSIOLOGY

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 5, No 5, Sep-Oct 84 pp 156-159

RUSALOV, V. M.

[Abstract] The proceedings of the joint symposium "Psychophysiology. Principles and Applications", held in Berlin under the auspices of the GDR Society of Psychologists and the Finnish Society of Psychologists, are reported. The five sections of the symposium discussed selective attention and event-dependent potentials, late components of event-dependent potential and cognitive processes, EEG and cognitive processes, physiological changes in the involuntary nervous system during processing of cognitive information, and stress and its psychophysiological correlates. The survey report of R. Naatanen showed the negative components of information processing in frontal brain lobes to be related to selective attention. Factors causing unexpected responses to standard stimuli were analyzed by A. Alho. Other papers covered theoretical and practical topics related to motivation, stress, intellectual and visual factors in psychological responses, tactile responses in various parts of the hand, contractions of pupils and heart function in relation to motivation, suppression of involuntary bodily functions due to stress, and other topics. Participants were largely from the GDR, Finland and Hungary.

[097-12131]

## IMPROVEMENT IN PUBLIC HEALTH

Riga SOVETSKAYA LATVIYA in Russian 26 Oct 84 p 1

[Abstract] Latvian specialists in the area of public hygiene and public health service organizers convened 25 October in Riga at their first republic congress. Delegates to the congress included specialists in the history of medicine in the LatSSR. Deputy Chairman of the LatSSR Council of Ministers, V.M. Krumin', delivered the opening address. V.V. Kanep, minister of health of Latvia, academician of the USSR Academy of Medical Sciences, discussed major trends in research in public hygiene and prospects of introducing the findings into public health practice. First Deputy of the USSR Ministry of Health, O.P. Shchepin, discussed further development of the prophylactic trend in Soviet public health service and listed some major problems facing public health agencies and institutions. Plenary and sectional meetings of the congress included presentation of 120 speeches and reports. Secretary of the Latvian Communist Party Central Committee, I.A. Anderson, participated in the congress.  
[146-2791]

MISCELLANEOUS

SHIP REPAIR SHOPS ON HIGH SEAS

Moscow IZVESTIYA in Russian 6 Oct 84 p 3

NOVODVORSKIY, I.

[Abstract] The fouling of ship exteriors by algae and various ostracods remains a continuing problem; fouling reduces the speed of ships and increases fuel consumption. A 1971 article in IZVESTIYA described the local initiative of workers and engineers of the Sevastopol association Yugrybkholodflot to have divers clean ship exteriors first in port and then in the open sea. The Estonian fishing kolkhoz Saare Kalur organized the cleaning of its trawlers on the western coast of Africa. Similar operations were also performed in the Far East. But these undertakings continued to be the efforts of local initiative; there was no organizational approach, nor was it supported by the Ministry of the Fishing Industry. In 1980 another IZVESTIYA article appeared on the organization of underwater inspection of vessels and the need for a more systematic approach. Finally, in 1983 official permission was obtained for an experimental voyage to evaluate the effectiveness of underwater cleaning and repair operations. The main result of this voyage was a conference in March 1984 sponsored by the Ministry of the Fishing Industry. Discussed were the underwater vessel "Krab," conversion of shrimp catchers for underwater work, diver salaries and the problem of special clothing for the diving-cleaning crew. After the conference, V. Kamentsev, Minister of the Fishing Industry, ordered that the various organizations and services associated with the Ministry solve the problems related to underwater maintenance and inspection. The resolution passed by the CPSU Central Committee and the USSR Council of Ministers on further growth of the fishing industry specified that the efficient use of the capacities of the fishing fleet be increased; this included the reduction of time spent for repair. Specialists in underwater maintenance and inspection have continued to make their contribution, but their efforts should be increased. Resolutions and orders should be fulfilled and soon, since a considerable amount of time has elapsed since the first IZVESTIYA article in 1971.

[050/A-9307]

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